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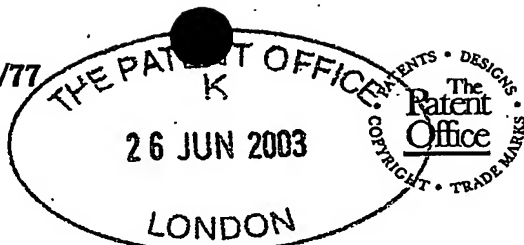
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# Request for grant of a patent

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26 JUN 2003

1. Your reference

P17824GB - NHF/ns

0314989.5

2. Patent application number

(The Patent Office will fill in this part)

27JUN03 E818290-4 000389  
P01/7700 0.00-0314989.5

3. Full name, address and postcode of the or of each applicant (underline all surnames)

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07031685 001

Patents ADP number (if you know it)

If the applicant is a corporate body, give the country/state of its incorporation

4. Title of the invention

"IMPROVEMENTS IN OR RELATING TO A VEHICLE FITTING"

5. Name of your agent (if you have one)

Forrester Ketley & Co.

"Address for service" in the United Kingdom to which all correspondence should be sent (including the postcode)

Forrester House  
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London  
N11 2EY

Patents ADP number (if you know it)

133001

6. If you are declaring priority from one or more earlier patent applications, give the country and the date of filing of the or of each of these earlier applications and (if you know it) the or each application number

Country

Priority application number  
(if you know it)

Date of filing  
(day / month / year)

7. If this application is divided or otherwise derived from an earlier UK application, give the number and the filing date of the earlier application

Number of earlier application

Date of filing  
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8. Is a statement of inventorship and of right to grant of a patent required in support of this request? (Answer 'Yes' if

Yes

- a) any applicant named in part 3 is not an inventor, or
  - b) there is an inventor who is not named as an applicant, or
  - c) any named applicant is a corporate body.
- See note (d))

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Continuation sheets of this form

Description

21

Claim(s)

8

Abstract

Drawing(s)

24 + 24 *KL*

10. If you are also filing any of the following, state how many against each item.

Priority documents

Translations of priority documents

Statement of inventorship and right to grant of a patent (*Patents Form 7/77*)

Request for preliminary examination and search (*Patents Form 9/77*)

Request for substantive examination (*Patents Form 10/77*)

Any other documents  
(please specify)

11. *I/We* request the grant of a patent on the basis of this application.

*Forrester Ketley & Co.*  
Signature

Date

26 June 2003

Forrester Ketley & Co.

12. Name and daytime telephone number of person to contact in the United Kingdom

FRANKLAND, Nigel H.  
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5 DESCRIPTION OF INVENTION

**"IMPROVEMENTS IN OR RELATING TO A VEHICLE FITTING"**

10

**THE PRESENT INVENTION** relates to a vehicle fitting and more particularly relates to a vehicle fitting suitable for use in a vehicle, such as, e.g. minibus or coach or ambulance, which is to be utilised by a number of passengers of different types, some of whom may be handicapped.

15

There are many vehicles which are used by a number of passengers, some of whom may be handicapped. Vehicles of this type are frequently operated by Local Councils, and the vehicles may transport patients who have various types of physical and/or mental handicap, some of whom may be in  
20 wheelchairs.

25

The provision of a seat fitting for a vehicle of this type presents the fitting designer with many challenges. An ideal seat fitting has a squab and a backrest in a conventional format so that the seat can be utilised by a seat occupant who has no physical handicap, the seat fitting being configured to provide a degree of protection to the seat occupant if the vehicle is provided in a front impact or in a rear impact.



Also the ideal seat fitting should be adaptable for use with a wheelchair. A seat fitting of this type may be desired so that the squab of the seat may be moved away from its first or "ordinary" position, with the backrest then being positioned so that the space in front of the backrest is unobstructed. Then a  
5 wheelchair may be brought up against the fitting, with a padded part of the fitting lying immediately behind the backrest of the wheelchair, and in such a way that a safety belt provided on the fitting may embrace the occupant of the wheelchair. In this way the safety belt may provide protection in the case of a front impact of the vehicle, and the part of the fitting located behind the  
10 backrest of the wheelchair will minimise the risk of the wheelchair occupant moving rearwardly out of the wheelchair in the event that a rear impact should occur.

Wheelchairs come in many different sizes, adult wheelchairs being  
15 relatively broad and some child wheelchairs being very narrow. The rearwardly projecting handles on the wheelchairs may thus have very different spacings between them.

The space available within a typical vehicle as used for the transport of  
20 handicapped people is generally limited and is often necessary to move a wheelchair, together with the wheelchair occupant, from the rear of the vehicle past a seat fitting of the type described above before the wheelchair can be manoeuvred into position with the backrest of the wheel chair located just in front of part of the fitting.

25

The design of the ideal fitting would take all of these factors into account.

Whilst various fittings have been proposed previously, all commercially available fittings have one or more drawbacks.

The present invention seeks to provides a improved fitting.

According to one aspect of this invention there is provided a fitting for a  
5 motor vehicle, the fitting comprising a support configured to be secured to the  
floor of the vehicle, the support being provided with a removable seat squab,  
and being provided with a seat back mounting and backrest, the backrest being  
mounted to the seat back mounting by a mechanism which enables the backrest  
to be moved from an initial rearward position to a forward position.

10

Preferably the squab is provided with two mounting fingers and two  
mounting lugs, the support being provided with slots or recesses to receive the  
fingers and hooks to engage the lugs.

15

Conveniently the backrest is connected to the seat back mounting by  
means of pivoting linkages.

20

Advantageously the backrest is connected to the seat back mounting by  
means of two upper pivotal linkages and two lower pivotal linkages, there  
being one upper and one lower pivotal linkage to one side of the seat back  
mounting and another upper and another lower pivot linkage to the other side of  
the seat back mounting.

25

Preferably each pivotal linkage comprises two linear links which are  
pivotally interconnected.

Advantageously an over dead centre mechanism is provided to move the  
backrest forwardly.

Advantageously the over dead centre mechanism comprises a drive bar passing through slots in two spaced apart plates provided on the backrest, the drive bar being mounted on a plurality of arms which are pivotally mounted to the mounting frame, so that the drive bar executes an arcuate movement.

Preferably a handle is provided to move the said pivotally mounted arms.

Conveniently a motor is provided which is actuable to move the backrest forwardly.

Preferably the motor is configured to drive the pivotally mounted arms.

Advantageously the support is provided with a winch, the winch being provided with at least one elongate flexible member provided with a termination configured to engage part of a wheelchair.

Preferably the winch is associated with a foot pedal to actuate the winch.

Conveniently the fitting is mounted on a base plate, the base plate being mounted on a platform for transverse movement.

Advantageously the base plate is provided with rollers between the base plate and the platform.

Preferably the base plate is provided with one or more dovetail projections extending downwardly to engage with one or more dovetail channels formed in the platform.

Conveniently a clamp is provided to clamp the base plate in position.

5 Preferably a band is provided associated with the platform to extend over the or each dovetail channel.

10 Preferably the or each band extends from the base plate to a guide provided at one end of the respective dovetail channel, then passing through a passage extending under the platform, before passing a guide at the other end of the dovetail channel and extending back to the other side of the base plate.

Advantageously the backrest and the mounting frame are relatively wide at the top, and have a lesser width in regions beneath the top.

15 Preferably the fitting is provided with at least one safety belt.

20 The invention also relates to a fitting for a motor vehicle, the fitting comprising a support, the support being provided with a squab and a backrest to form a seat, the squab being moveable from an initial position in which the squab projects forwardly from the support, the support being mounted for lateral movement.

25 Preferably the support is mounted on a base plate, and the base plate is mounted on a platform for transverse movement.

Conveniently the platform is provided with at least one transversely extending channel, the base plate being provided with at least one projection engaging the said at least one channel.

Preferably the or each channel is of dovetail form.

Advantageously a clamp is provided to clamp the base plate to the  
5 platform at a selected position.

Preferably a motor arrangement is provided to drive the base plate  
relative to the platform.

10 Conveniently the squab is a removable squab which may be removed  
from the support.

Advantageously the backrest is mounted on a backrest mounting frame  
by a mechanism actuatable to move the backrest forwardly, relative to the  
15 mounting frame, from an initial position to a second position.

Preferably the mechanism includes linkages which link the backrest to  
the mounting frame, and a drive mechanism.

20 Advantageously the drive mechanism is an over dead centre drive  
mechanism.

Preferably the drive mechanism includes a drive rod, opposed ends of  
the drive rod being received within slots provided in plates present on the  
25 backrest, the drive rod being mounted by at least one pivotally mounted arm so  
that the drive rod executes an arcuate motion upon pivotal movement of the  
arm.

Conveniently a handle is provided to actuate the arm.

Advantageously a motor arrangement is provided to actuate the arm.

- 5        Preferably a motor arrangement provided to move the backrest forwardly from the initial position to the second position.

Conveniently the backrest, and the mounting frame, have a relatively wide upper portion and a relatively narrow lower portion.

10

Preferably the fitting may be provided with a winch, the winch having at least one elongate flexible element with a termination to be connected to a wheelchair.

15

Advantageously the fitting is provided with at least one safety belt.

Preferably the safety belt passed through a guide loop located adjacent one edge of the upper part of the mounting frame.

20

Conveniently a seat back mounting frame is mounted to the support by a yieldable connection.

25

Advantageously the upper part of the support frame is a torsion plate and the lower part of the seat back mounting frame is a torsion plate, the torsion plates being interconnected and forming the yieldable connection.

Conveniently the winch is foot pedal actuated, the winch having at least one restraining ratchet and at one drive ratchet associated with a winding drum, the elongate flexible element being mounted on the winding drum, the retaining

ratchet serving to permit rotation of the drum in a winding in direction and prevent rotation of the drum in a winding out direction, the drive ratchet being engageable by a dog mounting on a foot pedal and resiliently biased towards the ratchet to engage the ratchet on depression of the foot pedal to rotate the  
5 drum in a winding in direction, and to effect a ratcheting movement over the ratchet when the foot pedal is released.

Preferably a manually operated element is present to release the retaining ratchet, and the ratchet on the foot pedal may be released by movement against  
10 the resilient bias to permit the drum to move in the winding out direction

The invention also relates to a fitting for a motor vehicle, the fitting comprising a frame supporting a backrest, the frame and the backrest being relatively broad at the top and being relatively narrow at a lower position.  
15

Conveniently the space in front of the backrest is unobstructed.

Preferably a removable seat squab is provided which may be mounted in position adjacent the backrest to form a seat.  
20

Conveniently the backrest is mounted on a mounting frame, and a mechanism is provided to move the backrest forwardly from an initial position to a second position.

25 Advantageously the mechanism includes linkages which link the backrest to the mounting frame and a drive mechanism.

Preferably the drive mechanism incorporates an over dead centre mechanism.

Advantageously the drive mechanism is manually driven.

Conveniently a motor arrangement is provided to move the backrest  
5 from the initial position to the second position.

Preferably the fitting is mounted for transverse movement.

Conveniently the fitting includes a base plate, the base plate being  
10 mounted on an underlying platform for transverse movement.

Preferably a motor arrangement is provided to drive the base plate  
relative to the platform.

Conveniently the fitting may be provided with at least one safety belt.  
15

Advantageously the safety belt passes through a guide loop provided at  
the top of the backrest adjacent to one edge of the backrest.

In order that the invention may be more readily understood, and so that  
20 further features thereof may be appreciated, the invention will now be  
described, with reference to the accompanying Figures, the Figures being  
photographs of one example of a seat fitting in accordance with the invention,  
in various conditions and photographs of an initial sub-assembly of the seat.

25

As will become clear from the following description a presently  
preferred seat fitting in accordance with the invention includes a support  
platform which is to be mounted in the floor of the vehicle. The base plate,  
which forms the lowermost part of the rectangular support frame, lies on the



platform and base plate may move relative to the support platform and may be clamped in a desired position.

5 A winch is provided which is mounted on a support frame. The seat squab is provided which can be releasably mounted on the support frame.

The uppermost part of the support frame carries a seat back mounting frame, and a seat back is connected to the mounting frame by a mechanism which enables the seat back to move forwardly relative to the mounting frame.  
10 When the seat back is in its forwardmost position it can tilt about a horizontal axis in the region of the midpoint of the seat back.

Both the mounting frame and the seat back are relatively wide at the tope, but much narrower in the middle and lower regions.  
15

A seat belt arrangement is provided which is mounted on the fitting for use by a user of the fitting.

It is to be appreciated, therefore, that an initial condition, with a squab  
20 mounted on the support frame, a seat may be used as a "ordinary" seat, but with the seat squab removed the fitting may be used to provide protection for a wheelchair occupant.

It is envisaged that when the fitting is to be utilised by a wheelchair  
25 occupant the entire fitting, mounted on the base plate, may be moved laterally of the axis of the vehicle towards a side wall of the vehicle, thus optimising the width of the gangway in the vehicle, to facilitate moving a wheelchair, and its occupant, forwardly past the fitting. The fitting may then be moved outwardly away from the wall and may be clamped in an appropriate position. With the

seat squab removed, the karabiners may be attached to parts of a wheelchair and the winch may be actuated to draw the wheelchair back towards the fitting so that the backrest of the wheelchair is brought into contact with or is located immediately in front of the backrest of the fitting. Should the wheelchair be an electric wheelchair, for example, which may have a bulky rearwardly directed protrusion behind the squab of the wheelchair, then the backrest of the fitting may be moved forwardly relative to the backrest mounting frame, so that there is then a considerable area of space behind the plane of the backrest, but in front of the support frame. When the back rest is in this condition the backrest may tilt.

Since the lower part of the and the lower part of the backrest mounting frame are relatively narrow, the described arrangement may be used with a child wheelchair, which may itself be relatively narrow. Here it is to be understood that the wheelchair may be provided with rearwardly directed handles, and those rearwardly directed handles must lie to either side of the backrest if the fitting is to operate in the intended manner with the backrest of the fitting lying immediately adjacent the backrest of the wheelchair.

Considering now the various elements of the described fitting in great detail, the support platform is in a form a unit which is to be mounted within the floor of a motor vehicle. The platform provides a generally planar upper surface, and the platform is provided with two parallel "dovetail" channels which extend across the entire width of the platform. When the platform is mounted in the motor vehicles these channels are to extend transversely of the longitudinal axis of the vehicle. Located at each end of each channel is a belt guide element in the form of a belt guide roller. A belt passage is provided which extends beneath each of the channels.

The base plate of the fitting is in the form a unit which is provided with the pending "dovetail" connections which are received in the two channels of the platform. The under-surface of the base plate is provided with a plurality of  
5 recesses and a roller is mounted in each recess to facilitate movement of the platform. The platform is also provided with a centrally located clamp arrangement to clamp the platform in position, the clamp arrangement incorporating a clamping screw which passes vertically through a threaded bush provided on the platform. The platform is provided with two rubber belts, each  
10 of which extends from a position on one side of the platform, lying immediately above a respective "dovetail" groove, the belt then passing over the top of the groove to the belt guide roller provided at the end of the groove. The belt passes over the belt guide roller and then extends through the belt passage, underneath the groove, to the belt guide roller provided at the other end of the  
15 groove on the other side of the platform. The belt, passing over this second belt guide roller then extends over the other part of the groove, with the end of the belt being connected again to the platform. The two belts thus serve to "mask" the dovetail grooves.

20 With the clamp in the release position, the platform may be moved freely to the left and to the right, the platform being supported on the rollers and being guided by the engagement of the dovetail elements within the dovetail grooves. When the platform is in a desired position the clamp may be actuated, the clamping screw being downwardly, which forces the base plate and the  
25 associated dovetail fittings upwardly, thus bringing the dovetail fittings into firm engagement with the dovetail channels, preventing further lateral movement of the base plate.

The support frame comprises two vertical side arms which extend upwardly from the support platform, the upper ends of the side arms being interconnected by a horizontally extending torsion plate.

5 In a lower part of the frame a winch is provided which extends between the side arms of the frame. In the upper part of the frame, each side of the frame defines a slot or passage to receive a mounting finger provided on the squab of the seat and each side arm of the frame is provided with a retaining hook, engageable with a co-operating lug provided on the squab of the seat, to  
10 retain the squab of the seat in position. Each hook is provided with a spring biased plunger having a protrusion which is engaged with an aperture formed in the side arm of the frame when the hook is engaged with the lug and is in the retaining position. Thus the hook can be locked in position to prevent inadvertent release of the hook.

15

A winch actuating pedal is pivotally mounted to the support frame.

The winch is in the form of a cylindrical drum. Connected to the drum are two lengths of strap, the free end of each length of strap being provided  
20 with a karabiner or hook for engagement with a wheelchair. The drum is provided with at least two ratchets, but in the illustrated embodiment, four ratchets are provided. The first two ratchets are provided at the opposed ends of the drum. These ratchets are associated with dogs which are in the form of pivotally mounted elongate members which move pivotally, under the effect of  
25 gravity, to engage the ratchet. The ratchet and the dogs are configured so that the drum may wind in the straps, with the dogs executing the ratcheting movement, but the dogs prevent the straps from being pulled away from the drum.

The two dogs are connected to a lifting strap, the free end of which passes through a guide loop provided towards the top of the backrest mounting frame, the lifting strap being such that when a manual tension is applied to a lifting strap the dogs are lifted to become disengaged from the ratchets, thus enabling the ratchet drum to rotate to pay out the straps.

The second two ratchets are centrally mounted, substantially in alignment with the pivotally mounted foot pedal. The pivotally mounted foot pedal has, mounted on it, a moveable dog, which is associated with a spring, which spring biases the dog. The dog is so positioned that initially the dog is spring biased into contact with each of the two central ratchets. When the foot pedal is actuated the dog engages the ratchets in such a way that the drum is rotated in an appropriate sense to wind in the straps. If the foot pedal is released, the dogs associated with the two outer ratchets will prevent the drum from rotating in the paying-out direction, but the foot pedal, under a spring bias provided by an appropriate spring, will move upwardly, and the dog on the foot pedal will move in a ratcheting manner over the teeth of the inner ratchets as the pedal moves upwardly. The pedal may then again be depressed to cause the drum to rotate again, drawing in more of the belts.

The dog on the foot pedal may be moved manually, against the spring force, to a release position. When the dog on the foot pedal is in the release position and when the two outer dogs associated with the ratchets at the opposed ends of the drum are in the release position, the straps may be pulled away from the fitting, with the drum of the winch rotating in a paying-out direction.

The seat back mounting frame is in the form a generally rectangular frame, the frame being provided with two side arms, the lower ends of the side arms being interconnected by a torsion plate. The lower parts of the side arms are parallel, but the upper parts of the side arms diverge. The uppermost ends  
5 of the side arms are interconnected by a cross piece. Mounting at each end of the cross piece, on the upper surface of the cross piece, is a respective seat belt guide loop. The guide loops are thus mounted an appropriate distance apart for use by an adult.

10 Each side arm of the frame is provided with two spaced apart mounting lugs, each of which is to engage with a mounting linkage as will be described. Mounted within the central part of the frame is an actuating handle, the actuating handle being a cranked handle which is mounted with pivotal movement about horizontal axis. A handle is provided with arms which extend  
15 forwardly from the pivot axis, the forwardly extending arms carrying a horizontally extending drive rod. The drive rod may, thus, on actuation of the handle execute an arcuate movement.

Two seat belt retractors are provided mounted on a rear part of the  
20 frame, the seat belt from each retractor passing upwardly through a respective guide loop. The free ends of the seat belts are connected to a lower part of the support frame. Seat belt buckles on appropriate stalks are provided, one being mounted on each side of the support frame. The buckles are to receive tongues which are mounted on the seat belts, as is conventional.

25

The seat back is in the form of a moveable unit having an inner frame, the forward face of the seat back being provided with padding and upholstery as is conventional. The rear face of the seat back is provided with four mounting lugs and the seat back is connected to the seat back mounting frame

by means of four separate linkages, each linkage extending from a lug on the seat back to a corresponding lug on the seat back mounting frame, each linkage comprising two straight links which are pivotally connected. Thus a lug on the seat back mounting frame is pivotally connected to one end of a link. The other  
5 end of the link is pivotally connected to one end of another link. The other end of the other link is pivotally connected to a lug provided on the seat back. The link elements are located so that the pivotal connections between the link elements are located inwardly towards the centre of the seat back, so that the linkages are within the periphery of the seat back and do not extend beyond the  
10 periphery of the seat back.

Provided at two spaced apart positions on the seat back are rearwardly extending guide plates, each guide plate being provided with a linear elongate slot, the slot extending substantially parallel with the front face of the seat back.  
15 The opposed ends of the drive rod provided on the handle which is mounted on the mounting frame are received within the slots.

The seat back may occupy an initial position in which the linkages are in a contracted condition. Thus each link of the linkages lies immediately  
20 adjacent to the substantially parallel to the other link, and the mounting lugs on the mounting frame are substantially in contact with the mounting lugs on the seat back. The drive bar, when the seat back is in this condition, is located substantially at the top of each of the elongate slots provided in the guide plates.

25

However, if the handle is now actuated so that the drive bar moves downwardly, because the drive bar executes an arcuate movement, the drive bar will move forwardly as it moves downwardly, thus moving the guide plates forwardly. As the guide plates moves forwardly so the linkages move to an

extended condition, with the two links of each linkage pivoting apart about the pivotal connection which interconnects the two links.

5 As the drive rod moves downwardly, so the drive will pass through a "dead centre" condition at which the drive rod has a maximum spacing from the mounting frame, and then the drive rod will move slightly back towards the mounting frame as it continues to move downwardly. The handle then occupies a final position, with part of the handle abutting a stop, or with the drive rod engaging the lowermost ends of the slots. With the seat back in this condition  
10 any force applied to the seat back attending to drive the seat back rearwardly towards the mounting frame will not enable the seat back to move rearwardly towards the mounting frame, since any rearward movement of the seat back would only be permissible if the drive rod could move further downwardly.

15 It is to be appreciated that with the seat back in this forward position, the seat back may move pivotally about an axis defined by the drive rod. If the uppermost part of the seat back, for example, is pressed rearwardly, the two linkages provided towards the top of the seat back will tend to be slightly compressed whilst the linkages at the lowermost part of the seat belt will be  
20 more extended, and vice versa.

Of course it is to be understood that the linkages are provided above and below the position of the handle and the associated drive rod.

25 The seat squab comprises a convention squab provided, at the rearmost part thereof with two rearwardly extending fingers, dimensioned to be received within the slots or channels of the support frame, and being provided with two retaining lugs which may be in the form of outwardly extending rods or studs, to be engaged by the hooks.



It is to be appreciated that the fitting may have an initial condition in which the fingers provided on the squab are received in the slots or channels, the hooks engage the lugs, and the spring biased plungers on the hooks are in  
5 such a conditions that the plungers engage the apertures provided in the side arms of the support frame, thus ensuring that the hooks are retained securely in position. The two safety belts may then be used by a seat occupant in a conventional manner, to provide two lap-end-diagonal seat belts. The use of two lap-end-diagonal seat belts is preferred, especially if the seat is to be  
10 occupied by an occupant who may be mentally handicapped.

If the fitting is then to be used by a wheelchair occupant, initially the squab of the seat will be removed. Each plunger on each hook will be withdrawn from its aperture in the side arm of the support frame, by pulling the  
15 plunger outwardly against its spring bias. The hooks may then be disengaged from the lugs provided on the seat squab, and the fingers on the rear of the seat squab may be withdrawn from the recesses or slots which initially accommodated the said fingers. The seat squab may then be put to one side.

20 If necessary, the clamp on the base plate may be released, by actuating the screw appropriating to withdraw from engagement with the underlying platform. The base plate, which supports the whole of the fitting, may then be moved to the left or the right, as is appropriate, to provide the optimum access for a wheelchair. A wheelchair may then be moved to a position in front of the  
25 fitting. The base plate may then be moved to a desired final position and the clamp may be re-tightened.

The wheelchair may be positioned in front of the fitting, and the two dogs on the winch may be released, enabling the belts, with the associated

karabiners, to be withdrawn from the winch, with the winch drum rotating in a paying-out direction. The hooks or karabiners may be engaged with appropriate parts of the wheelchair.

5 If the wheelchair is, for example, an electric wheelchair, or if the wheelchair has a bulky rearwardly directed projection located to the rear of and beneath the squab of the wheelchair, the backrest of the fitting may be moved forwardly simply by actuating the handle in the manner described above to move the drive rod arcuately and downwardly.

10

The winch may then be actuated, in the manner described above, to draw the wheelchair, and the occupant, into a position such that the backrest of the wheelchair lies in contact with or immediately adjacent the front part of the backrest of the fitting. The seat belts provided on the fitting may then be  
15 applied to the wheelchair occupant, thus restraining the wheelchair occupant in position.

The torsion plate that forms the lowermost part of the mounting frame is connected to parts of the torsion plate which form the uppermost part of the  
20 support frame.

Should an accident occur which applies a forward force to the backrest mounting frame, in other words if a vehicle in which the fitting is mounted is involved in a front impact, then if the force is sufficiently large, the two torsion  
25 plates will distort, permitting the backrest to move slightly forwardly, whilst absorbing energy. This may minimise the risk of injury occurring to the seat occupant. Similarly should the vehicle be involved in a rear impact, which may cause a rearwardly directed force to be applied to the seat back, again the torsion plates may distort, permitting the backrest to move rearwardly slightly,

whilst absorbing energy, and this again, it is believed, will minimise the risk of injury occurring to the seat occupant. The torsion plates may, in an accident situation, be distorted or deformed plastically, so that the plates remain distorted, but alternatively the plates may only be distorted in a resilient manner, so that at the end of the accident the plates return to their initial position.

In the embodiment described above, the moveable parts of the fitting have been described as being moved by hand. However, of course, it is envisaged that in an automated embodiment of the invention, the moveable parts will move in response to actuation of appropriate motors. For example, an appropriate arrangement may be provided to drive the base plate relative to the platform. For example, each of the dovetail elements provided on the base plate extending down into dovetail grooves in the platform may be provided with a threaded bore, and a long threaded stud may be provided, passing through the bores, the stud lying within the dovetail channel. The threaded stud may be driven by an appropriate motor, the sense of rotation of the stud dictating the direction of movement of the base plate. In an arrangement of this type it may not be necessary to provide the clamp for the base plate as the effect of the motor and the screw threaded engagement between the threaded stud and the threaded bores provided in the dovetail elements will be sufficient to retain the base plate in a desired position. Of course, many alternative motor arrangements may be used to move the base plate relative to the platform.

A second motor arrangement may be provided to move the backrest forwardly relative to the mounting frame. A plate associated with the described handle may be provided with a toothed rack, and a motor may be provided driving a cog that engages the rack, actuation of the motor thus causing the arms which carry the drive rod to move in a manner equivalent to that described

above. However, again, many alternative motor arrangements may be provided which drive the backrest forwardly and rearwardly relative to the support frame.

- 5           In the present specification "comprises" means "includes or consists of" and "comprising" means "including or consisting of".

10           The features disclosed in the foregoing description, or the following claims, or the accompanying drawings, expressed in their specific forms or in terms of a means for performing the disclosed function, or a method or process for attaining the disclosed result, as appropriate, may, separately, or in any combination of such features, be utilised for realising the invention in diverse forms thereof.

## CLAIMS:

- 5 1. A fitting for a motor vehicle, the fitting comprising a support configured to be secured to the floor of the vehicle, the support being provided with a removable seat squab, and being provided with a seat back mounting and backrest, the backrest being mounted to the seat back mounting by a mechanism which enables the backrest to be moved from an initial rearward  
10 position to a forward position.
2. A fitting according to Claim 1, wherein the squab is provided with two mounting fingers and two mounting lugs, the support being provided with slots or recesses to receive the fingers and hooks to engage the lugs.
- 15 3. A fitting according to Claim 1 or 2, wherein the backrest is connected to the seat back mounting by means of pivoting linkages.
4. A fitting according Claim 3, wherein the backrest is connected to the  
20 seat back mounting by means of two upper pivotal linkages and two lower pivotal linkages, there being one upper and one lower pivotal linkage to one side of the seat back mounting and another upper and another lower pivot linkage to the other side of the seat back mounting.
- 25 5. A fitting according to Claim 4, wherein each pivotal linkage comprises two linear links which are pivotally interconnected.
6. A fitting according to any one Claims 1 to 5, wherein an over dead centre mechanism is provided to move the backrest forwardly.

7. A fitting according to Claim 6, wherein the over dead centre mechanism comprises a drive bar passing through slots in two spaced apart plates provided on the backrest, the drive bar being mounted on a plurality of arms which are  
5 pivotally mounted to the mounting frame, so that the drive bar executes an arcuate movement.

8. A fitting according to Claim 7, wherein a handle is provided to move the said pivotally mounted arms.  
10

9. A fitting according to any one of the preceding Claims wherein a motor is provided which is actuable to move the backrest forwardly.

10. A fitting according to Claim 9 as dependent upon Claim 7, wherein the  
15 motor is configured to drive the pivotally mounted arms.

11. A fitting according to any one of the preceding Claims, wherein the support is provided with a winch, the winch being provided with at least one elongate flexible member provided with a termination configured to engage  
20 part of a wheelchair.

12. A fitting according to Claim 11, wherein the winch is associated with a foot pedal to actuate the winch.

13. A fitting according to any of the preceding Claims, wherein the fitting is  
25 mounted on a base plate, the base plate being mounted on a platform for transverse movement.

14. A fitting according to Claim 13, wherein the base plate is provided with rollers between the base plate and the platform.

5 15. A fitting according to Claim 13 or 14, wherein the base plate is provided with one or more dovetail projections extending downwardly to engage with one or more dovetail channels formed in the platform.

16. A fitting according to any one of Claims 13 to 15, wherein a clamp is provided to clamp the base plate in position.

10

17. A fitting according to Claims 15 or 16, wherein a band is provided associated with the platform to extend over the or each dovetail channel.

18. A fitting according to Claim 17, wherein the or each band extends from the base plate to a guide provided at one end of the respective dovetail channel, then passing through a passage extending under the platform, before passing a guide at the other end of the dovetail channel and extending back to the other side of the base plate.

20 19. A fitting according to any of the preceding Claims, wherein the backrest and the mounting frame are relatively wide at the top, and have a lesser width in regions beneath the top.

20. A fitting according to any of the preceding Claims, wherein the fitting is provided with at least one safety belt.

25

21. A fitting for a motor vehicle, the fitting comprising a support, the support being provided with a squab and a backrest to form a seat, the squab

being moveable from an initial position in which the squab projects forwardly from the support, the support being mounted for lateral movement.

22. A fitting according to Claim 21, wherein the support is mounted on a base plate, and the base plate is mounted on a platform for transverse movement.

23. A fitting according to Claim 22, wherein the platform is provided with at least one transversely extending channel, the base plate being provided with at least one projection engaging the said at least one channel.

24. A fitting according to Claim 22, wherein the or each channel is of dovetail form.

25. A fitting according to any of Claims 22 to 24, wherein a clamp is provided to clamp the base plate to the platform at a selected position.

26. A fitting according to any one Claims 22 to 25, wherein a motor arrangement is provided to drive the base plate relative to the platform.

20

27. A fitting according to any of the preceding Claims, wherein the squab is a removable squab which may be removed from the support.

28. A fitting according to any one of Claims 21 to 27, wherein the backrest is mounted on a backrest mounting frame by a mechanism actuable to move the backrest forwardly, relative to the mounting frame, from an initial position to a second position.

25



29. A fitting according to Claim 28, wherein the mechanism includes linkages which link the backrest to the mounting frame, and a drive mechanism.

30. A fitting according to Claim 29, wherein the drive mechanism is an over  
5 dead centre drive mechanism.

31. A fitting according to any one of Claims 29 to 30, wherein the drive mechanism includes a drive rod, opposed ends of the drive rod being received within slots provided in plates present on the backrest, the drive rod being  
10 mounted by at least one pivotally mounted arm so that the drive rod executes an arcuate motion upon pivotal movement of the arm.

32. A fitting according to Claim 31, wherein a handle is provided to actuate the arm.  
15

33. A fitting according to Claim 31, wherein a motor arrangement is provided to actuate the arm.

34. A fitting according to one of Claims 28 to 32, wherein a motor arrangement provided to move the backrest forwardly from the initial position  
20 to the second position.

35. A fitting according to any one of Claims 21 to 34, wherein the backrest, and the mounting frame, have a relatively wide upper portion and a relatively  
25 narrow lower portion.

36. A fitting according to any one of Claims 21 to 34 provided with a winch, the winch having at least one elongate flexible element with a termination to be connected to a wheelchair.

37. A fitting according to any of Claims 21 to 36 provided with at least one safety belt.

5 38. A fitting according to Claim 37, wherein the safety belt passed through a guide loop located adjacent one edge of the upper part of the mounting frame.

39. A fitting according to any one the preceding Claims, wherein a seat back mounting frame is mounted to the support by a yieldable connection.

10

40. A fitting according to Claim 39, wherein the upper part of the support frame is a torsion plate and the lower part of the seat back mounting frame is a torsion plate, the torsion plates being interconnected and forming the yieldable connection.

15

41. A fitting according to Claim 11 or 36 or any Claim dependent thereon, wherein the winch is foot pedal actuated, the winch having at least one restraining ratchet and at one drive ratchet associated with a winding drum, the elongate flexible element being mounted on the winding drum, the retaining  
20 ratchet serving to permit rotation of the drum in a winding in direction and prevent rotation of the drum in a winding out direction, the drive ratchet being engageable by a dog mounting on a foot pedal and resiliently biased towards the ratchet to engage the ratchet on depression of the foot pedal to rotate the drum in a winding in direction, and to effect a ratcheting movement over the  
25 ratchet when the foot pedal is released.

42. A fitting according to Claim 41, wherein a manually operated element is present to release the retaining ratchet, and the ratchet on the foot pedal may be

released by movement against the resilient bias to permit the drum to move in the winding out direction.

43. A fitting for a motor vehicle, the fitting comprising a frame supporting a backrest, the frame and the backrest being relatively broad at the top and being relatively narrow at a lower position.

44. A fitting according to Claim 43, wherein the space in front of the backrest is unobstructed.

45. A fitting according to Claim 43 or 44, wherein a removable seat squab is provided which may be mounted in position adjacent the backrest to form a seat.

46. A fitting according to any of Claims 43 to 45, wherein the backrest is mounted on a mounting frame, and a mechanism is provided to move the backrest forwardly from an initial position to a second position.

47. A fitting according to Claim 46, wherein the mechanism includes linkages which link the backrest to the mounting frame and a drive mechanism.

48. A fitting according to Claim 47, wherein the drive mechanism incorporates an over dead centre mechanism.

49. A fitting according to Claim 48, wherein the drive mechanism is manually driven.

50. A fitting according to any one Claims 46 to 49, wherein a motor arrangement is provided to move the backrest from the initial position to the second position.

5 51. A fitting according to any one of Claims 43 to 50, wherein the fitting is mounted for transverse movement.

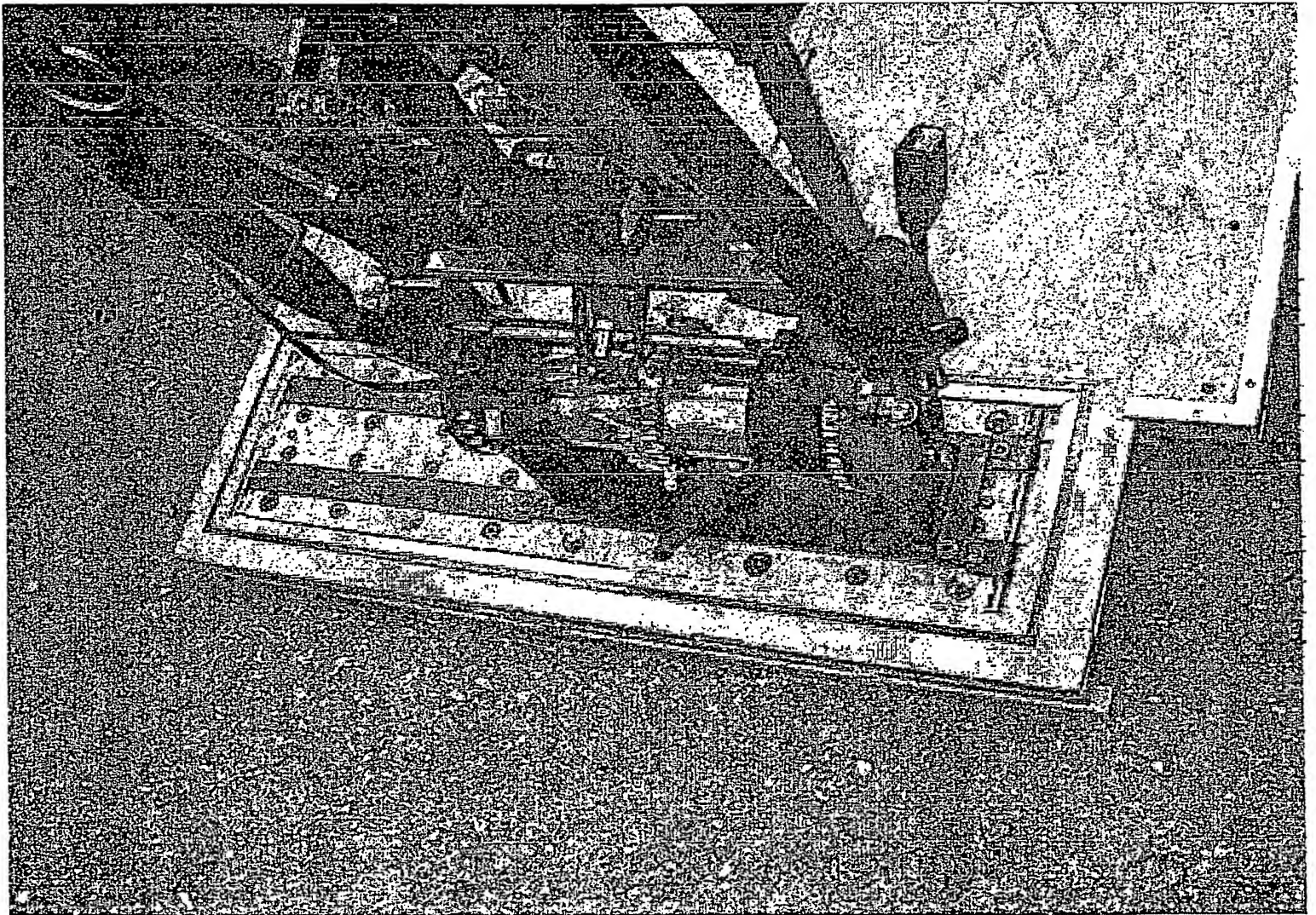
52. A fitting according to Claim 51, wherein the fitting includes a base plate, the base plate being mounted on an underlying platform for transverse  
10 movement:

53. A fitting according to Claim 52, wherein a motor arrangement is provided to drive the base plate relative to the platform.

15 54. A fitting according to any one of preceding Claims provided with at least one safety belt.

55. A fitting according to Claim 54, wherein the safety belt passes through a guide loop provided at the top of the backrest adjacent to one edge of the  
20 backrest.

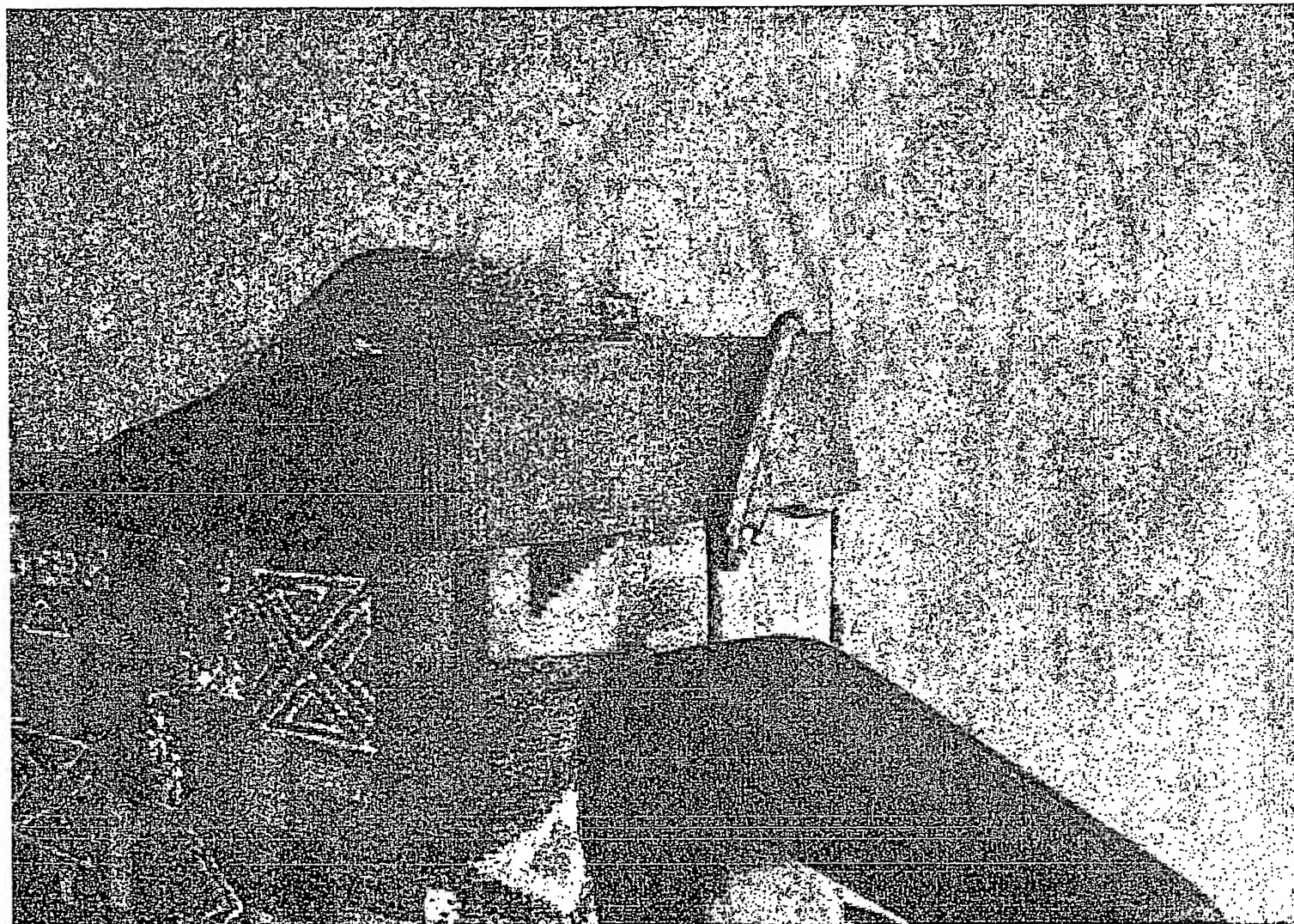
56. A fitting substantially as herein and described with reference to and as shown in the accompanying photographs.



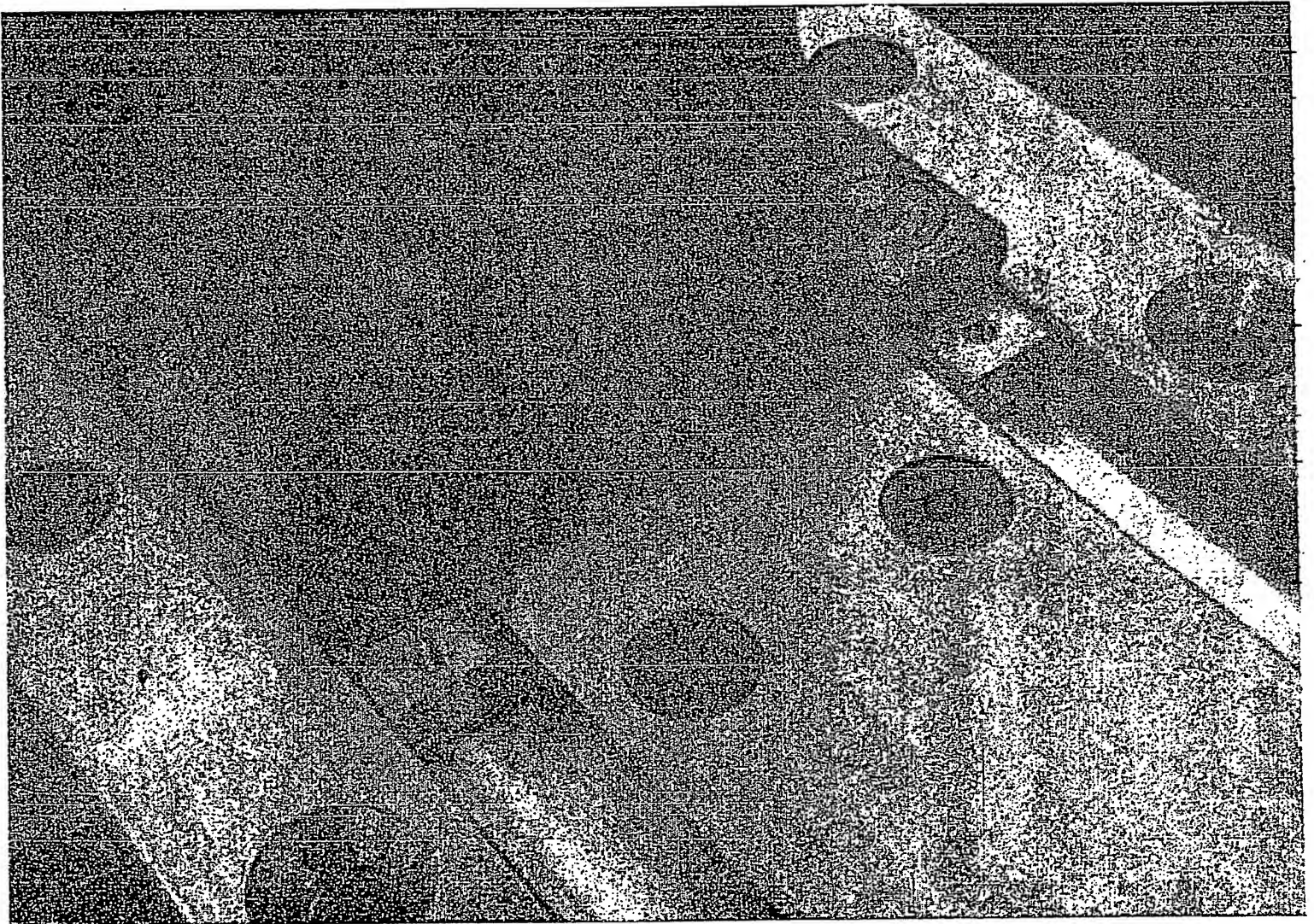




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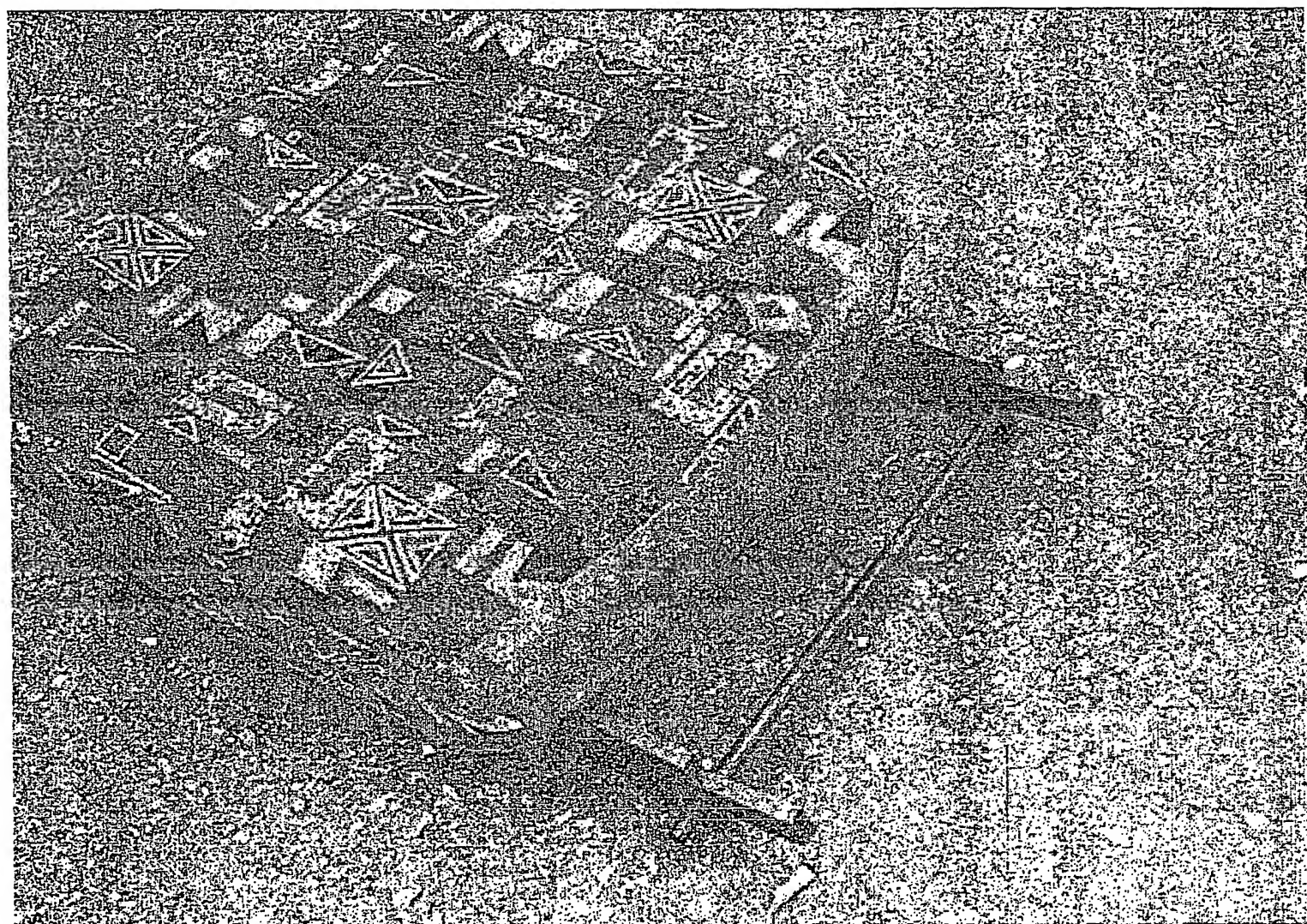


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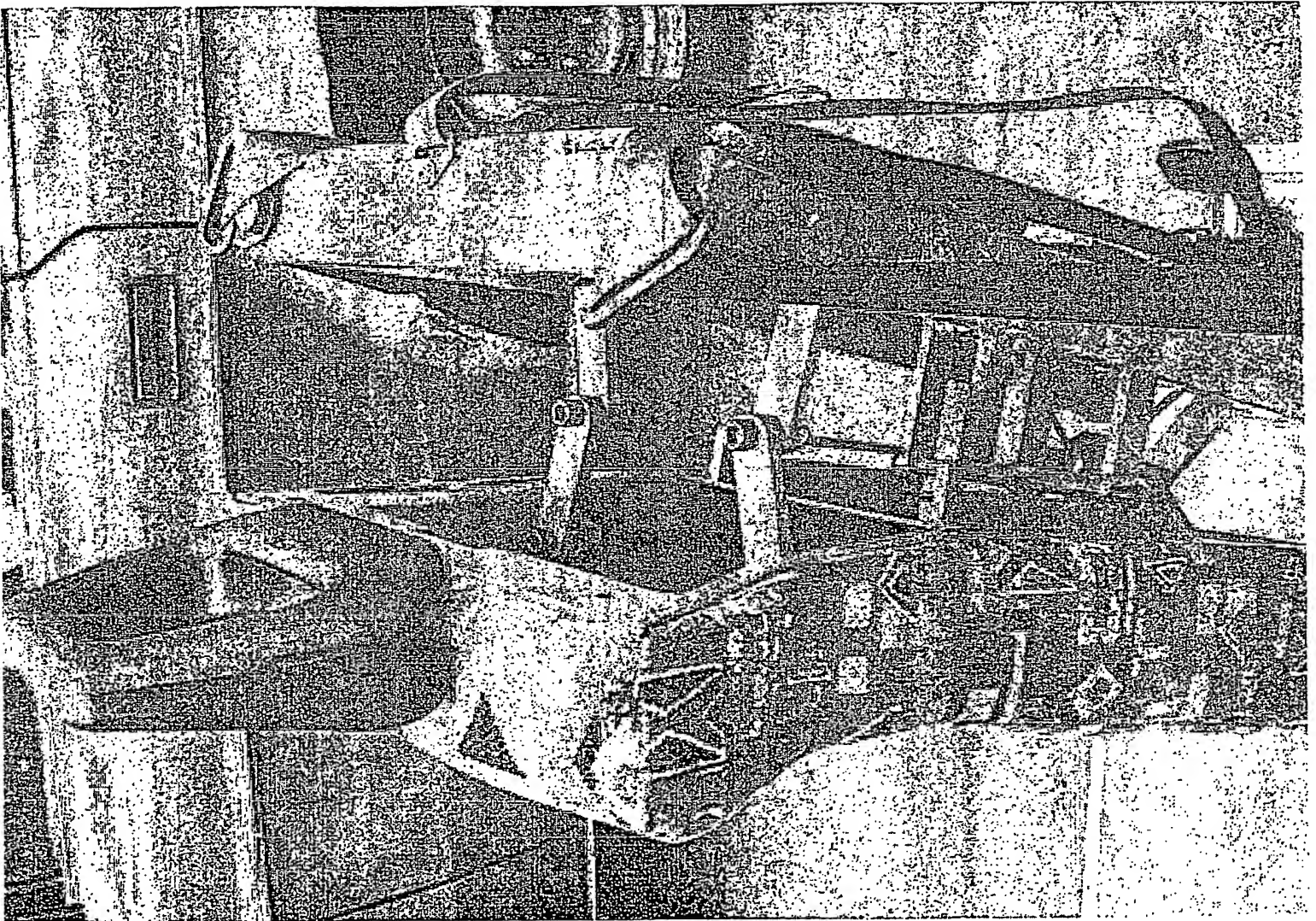




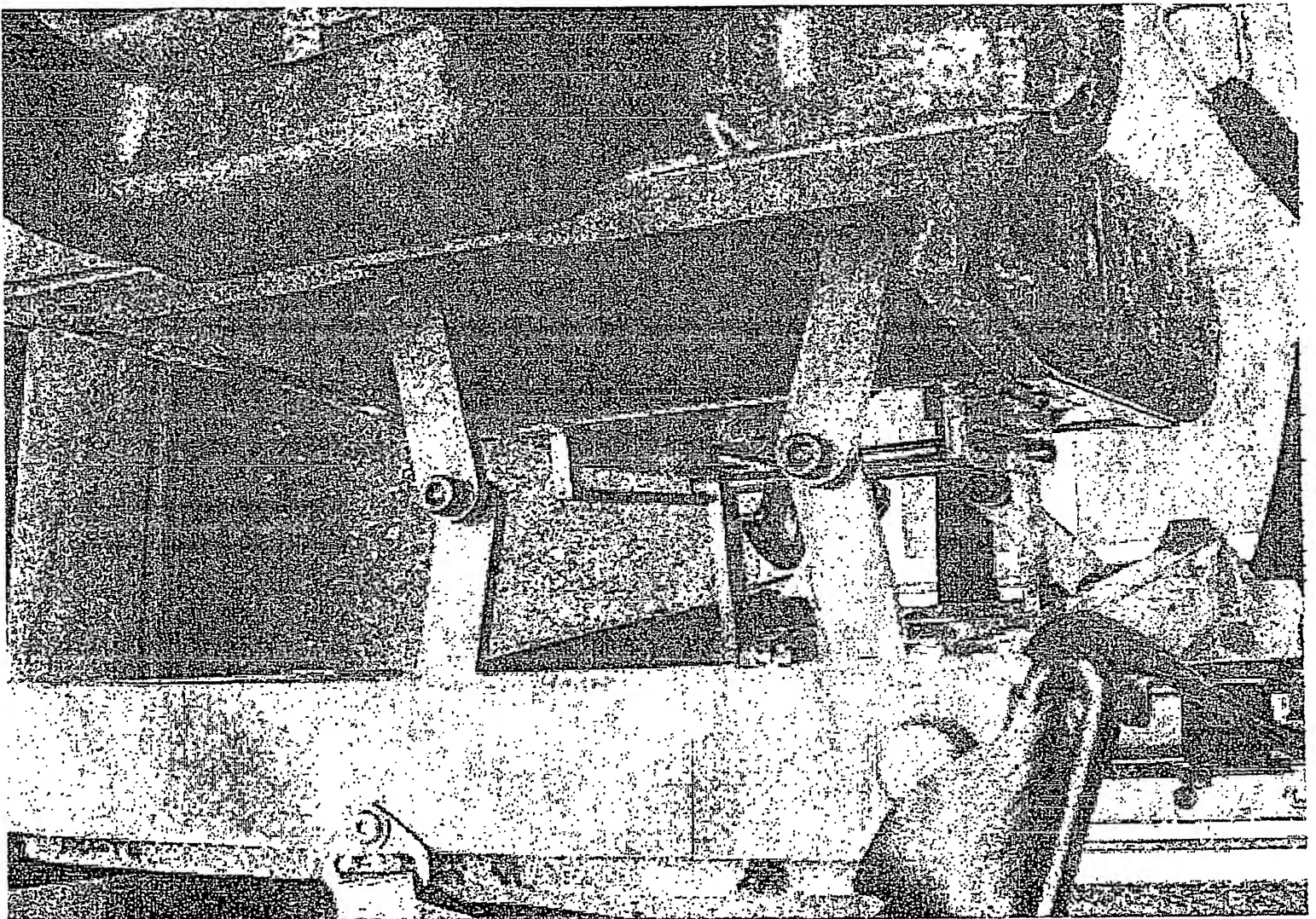
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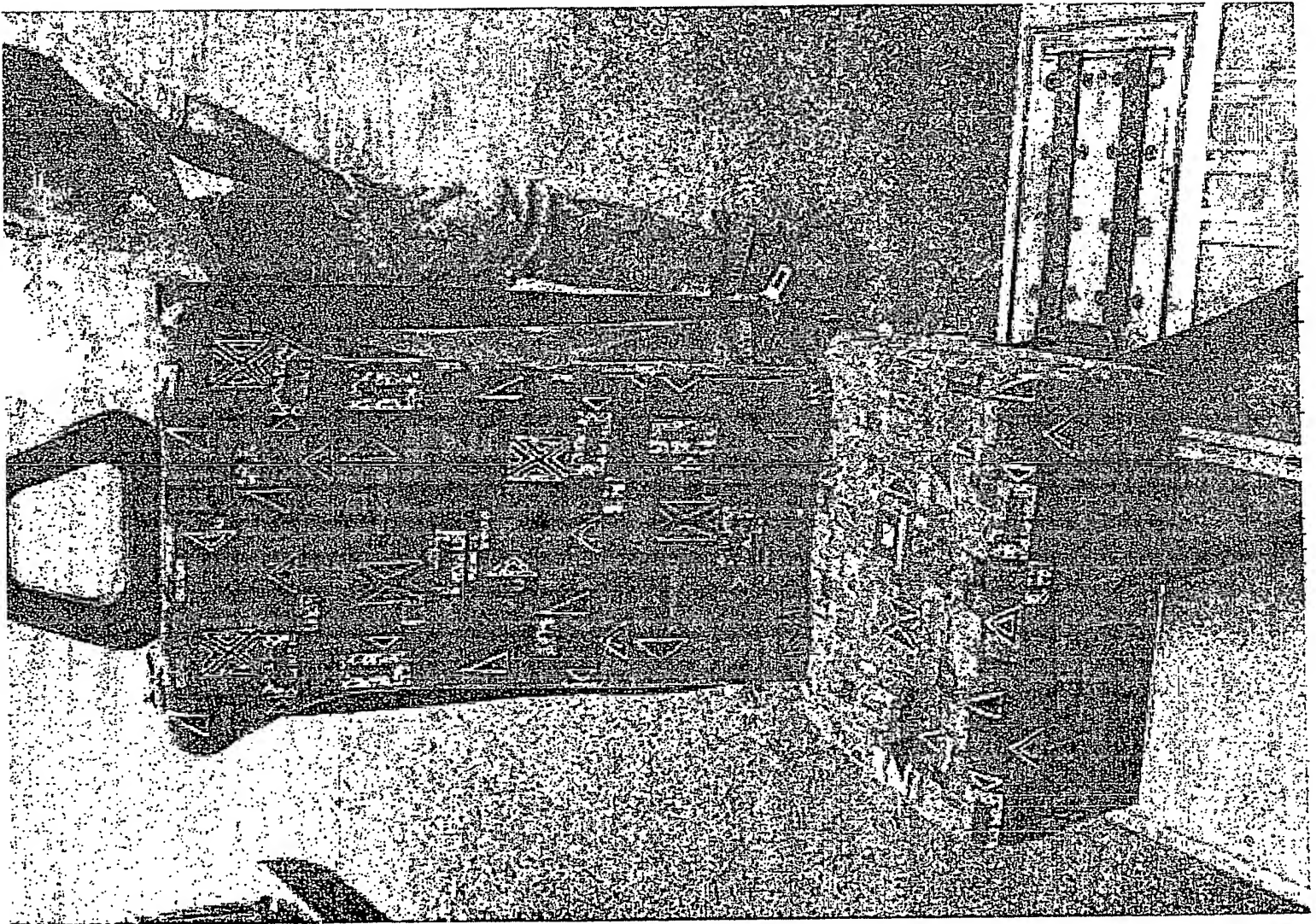
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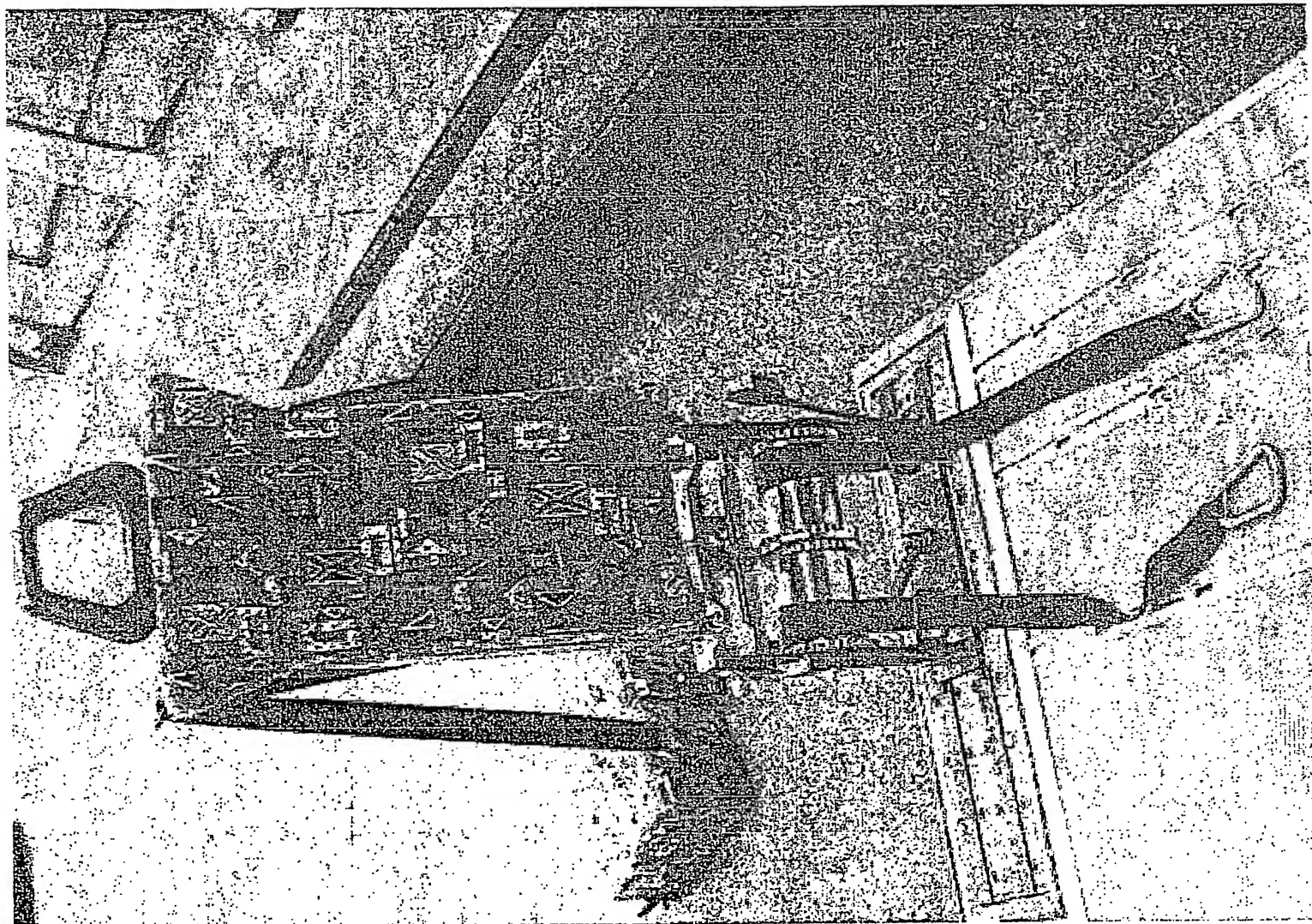


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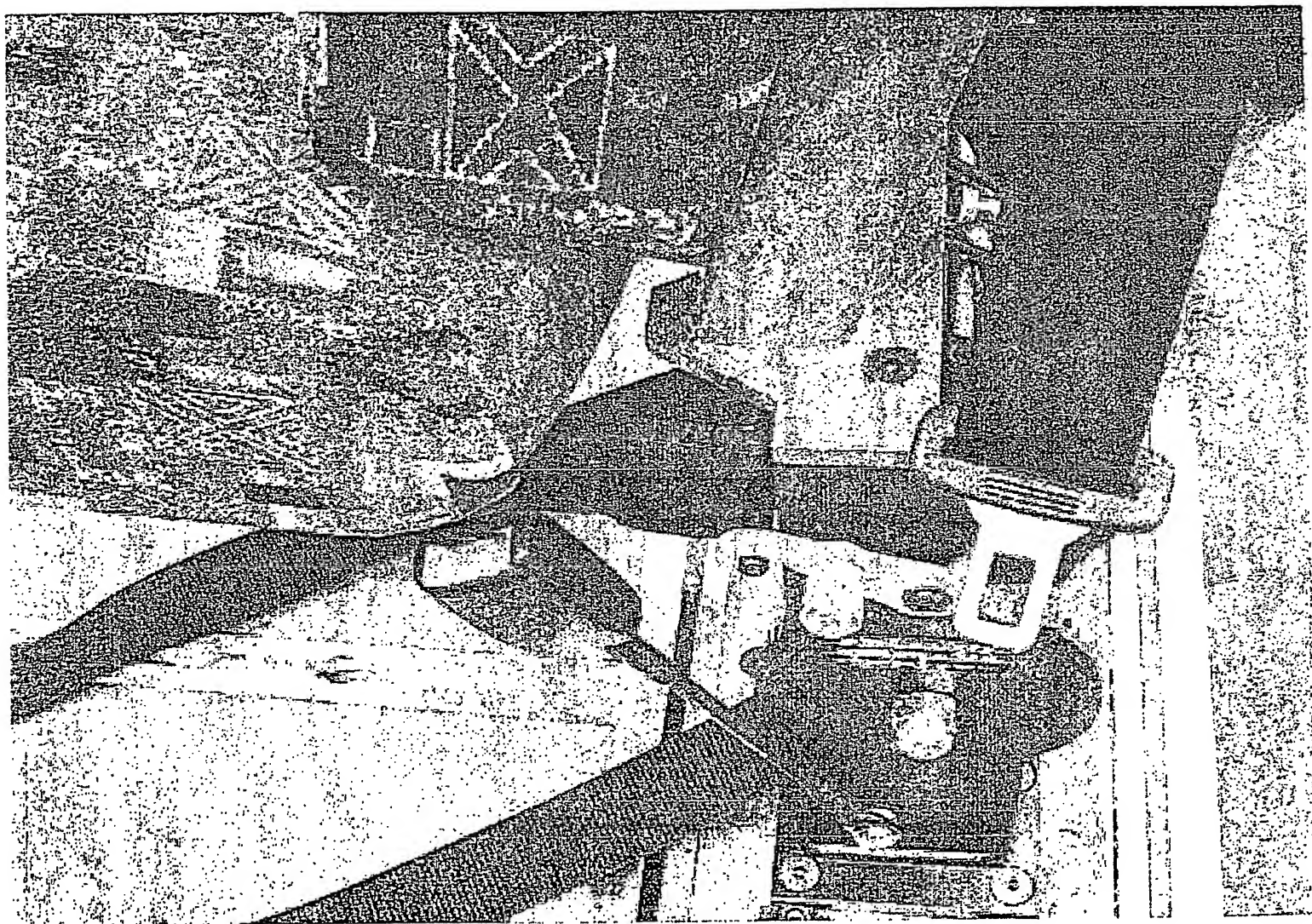


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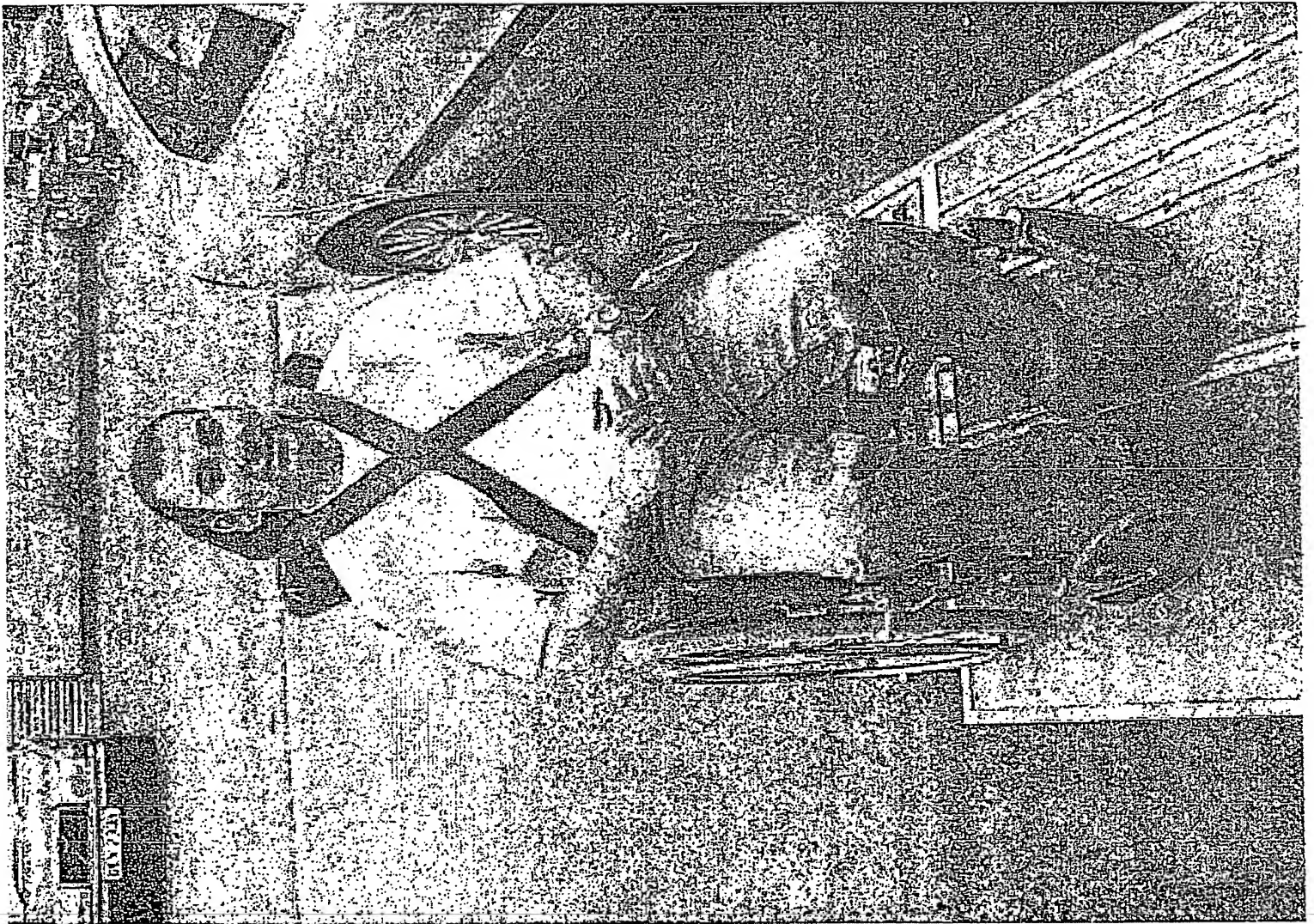




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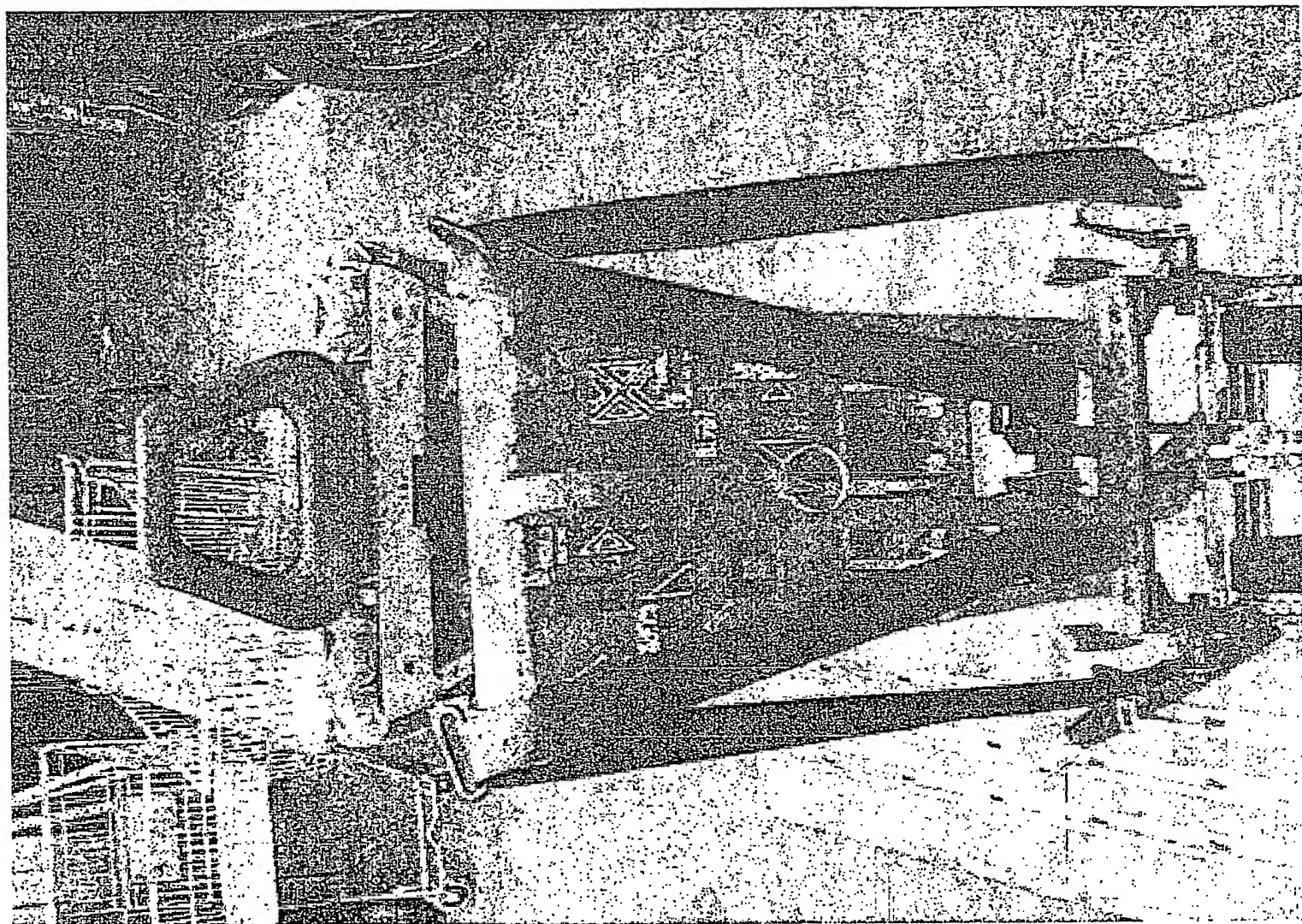


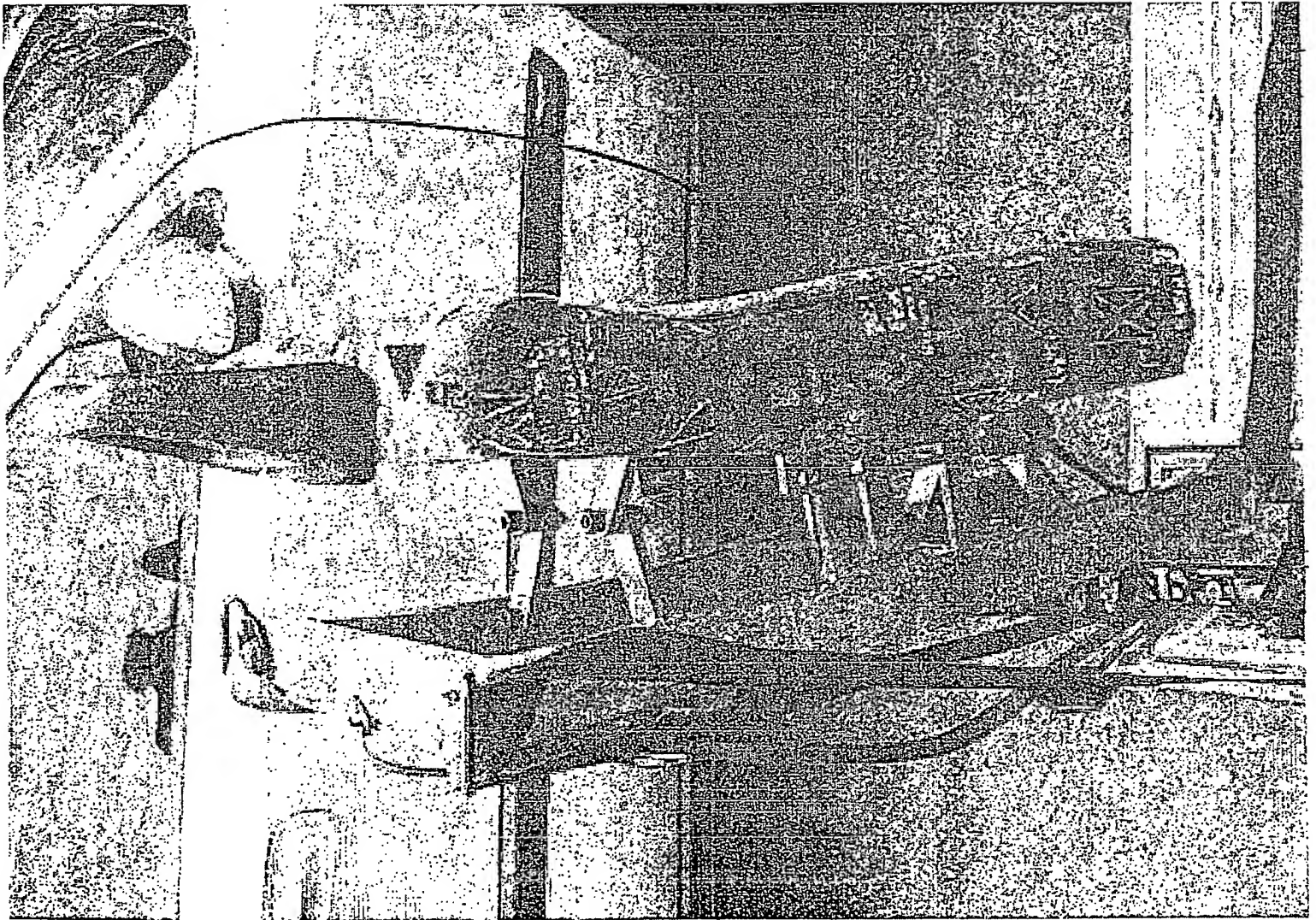
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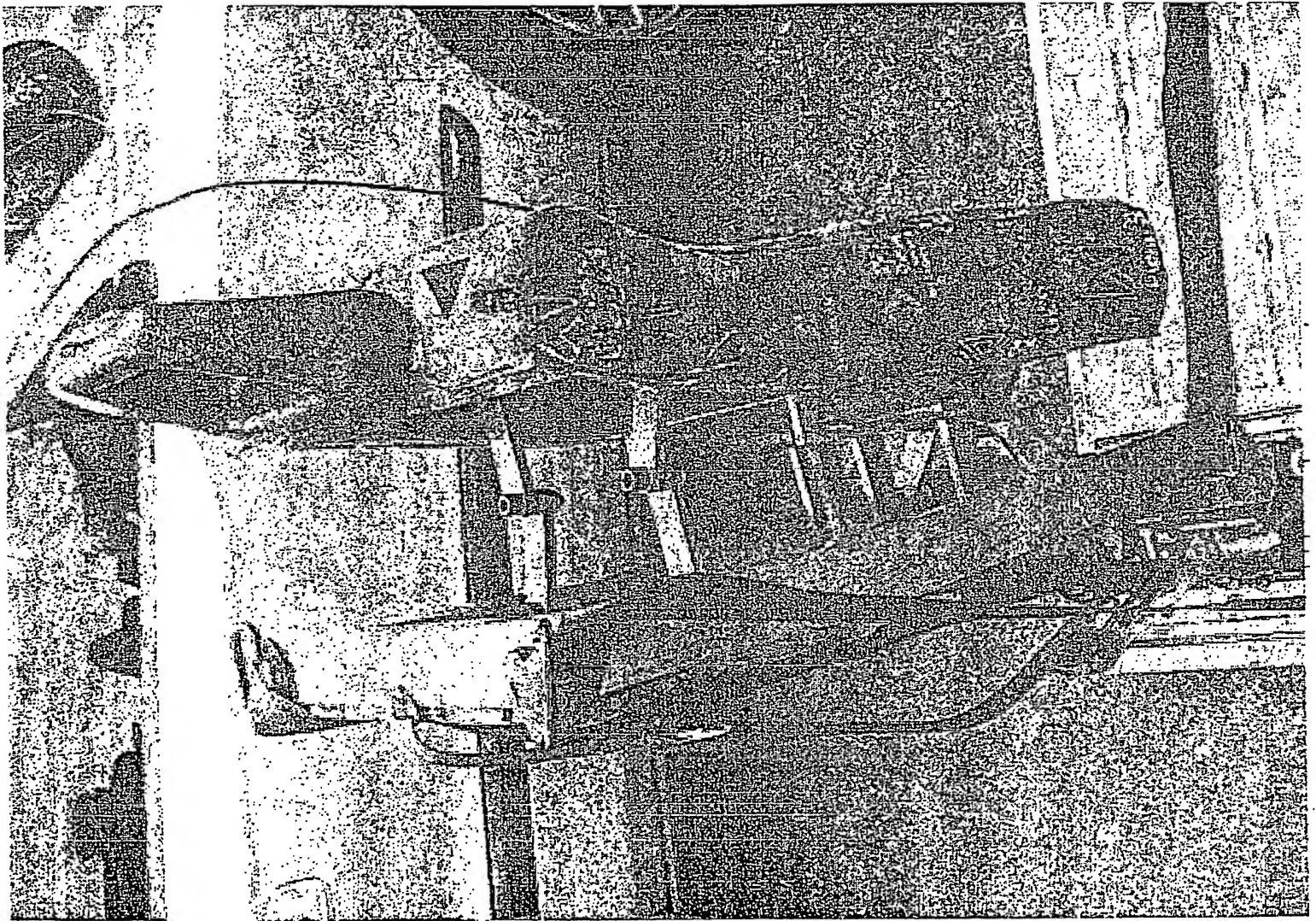




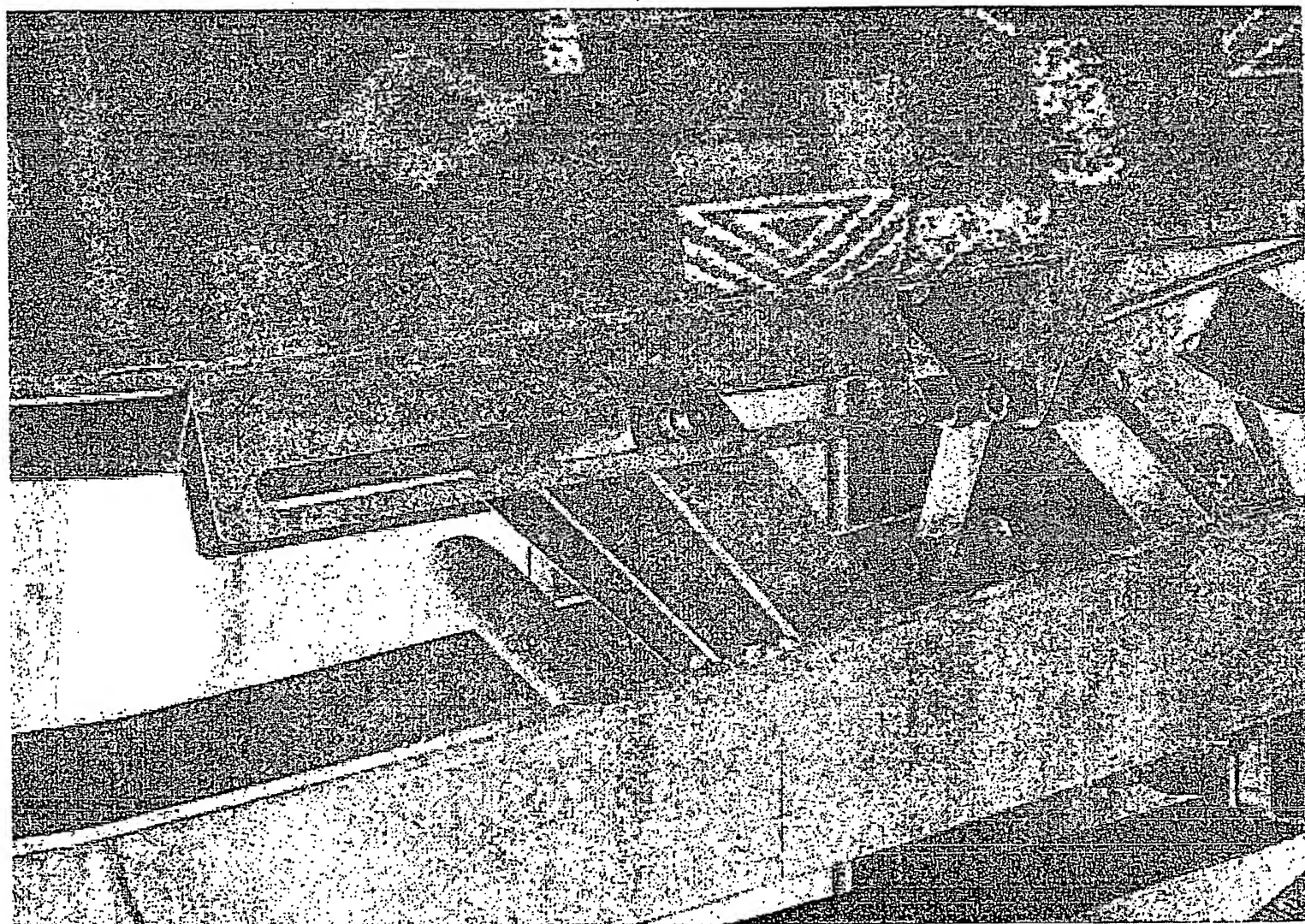




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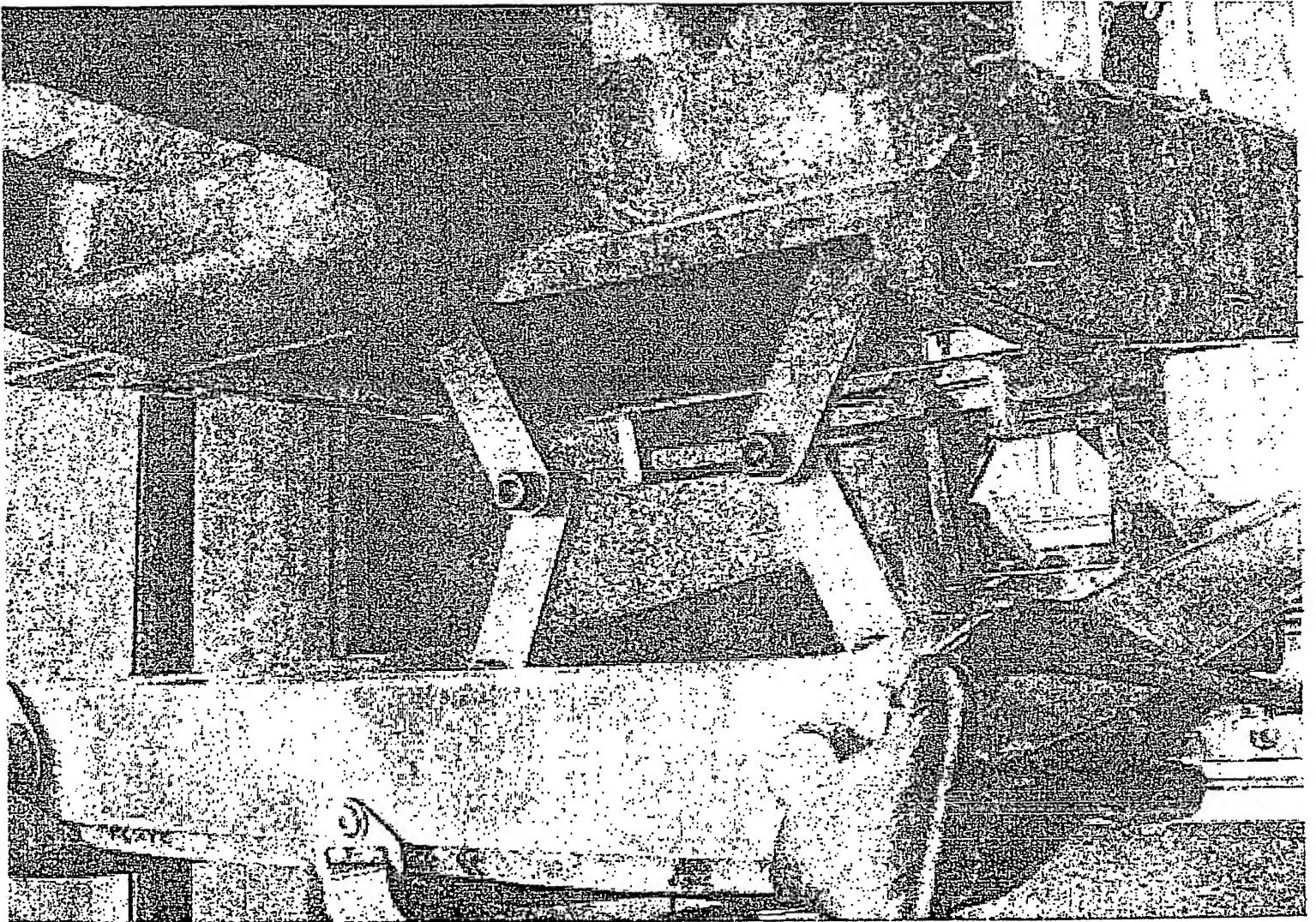


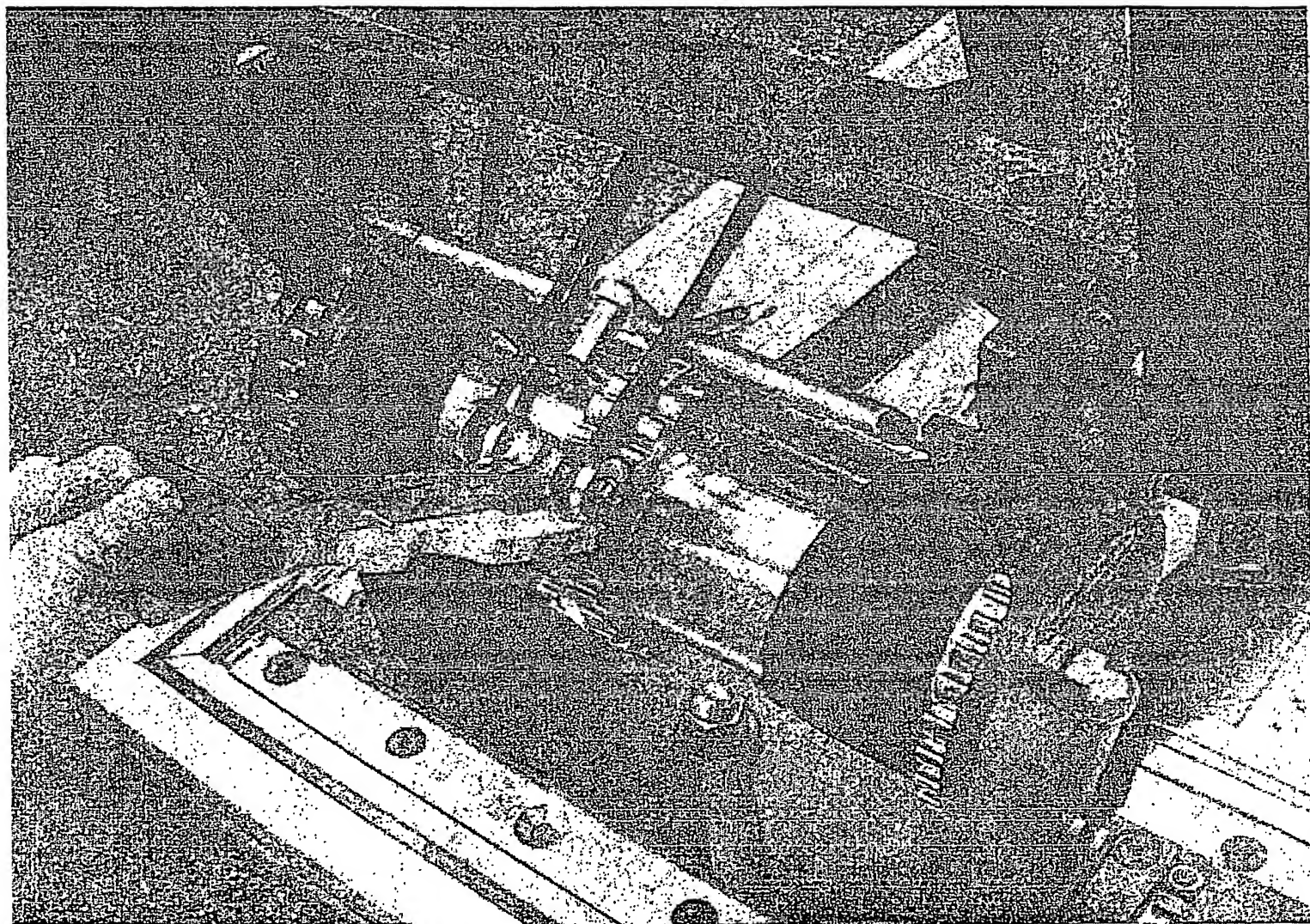
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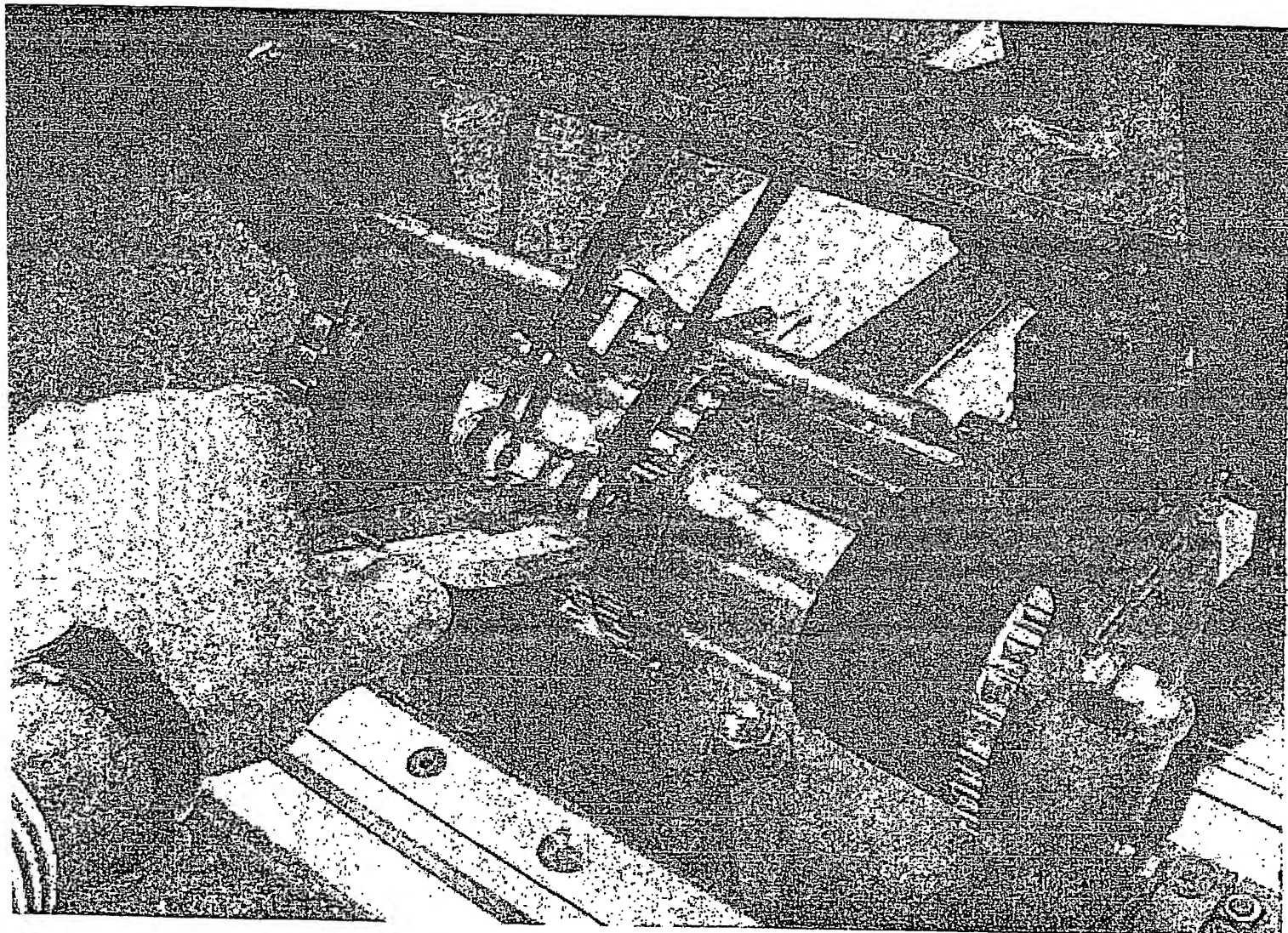


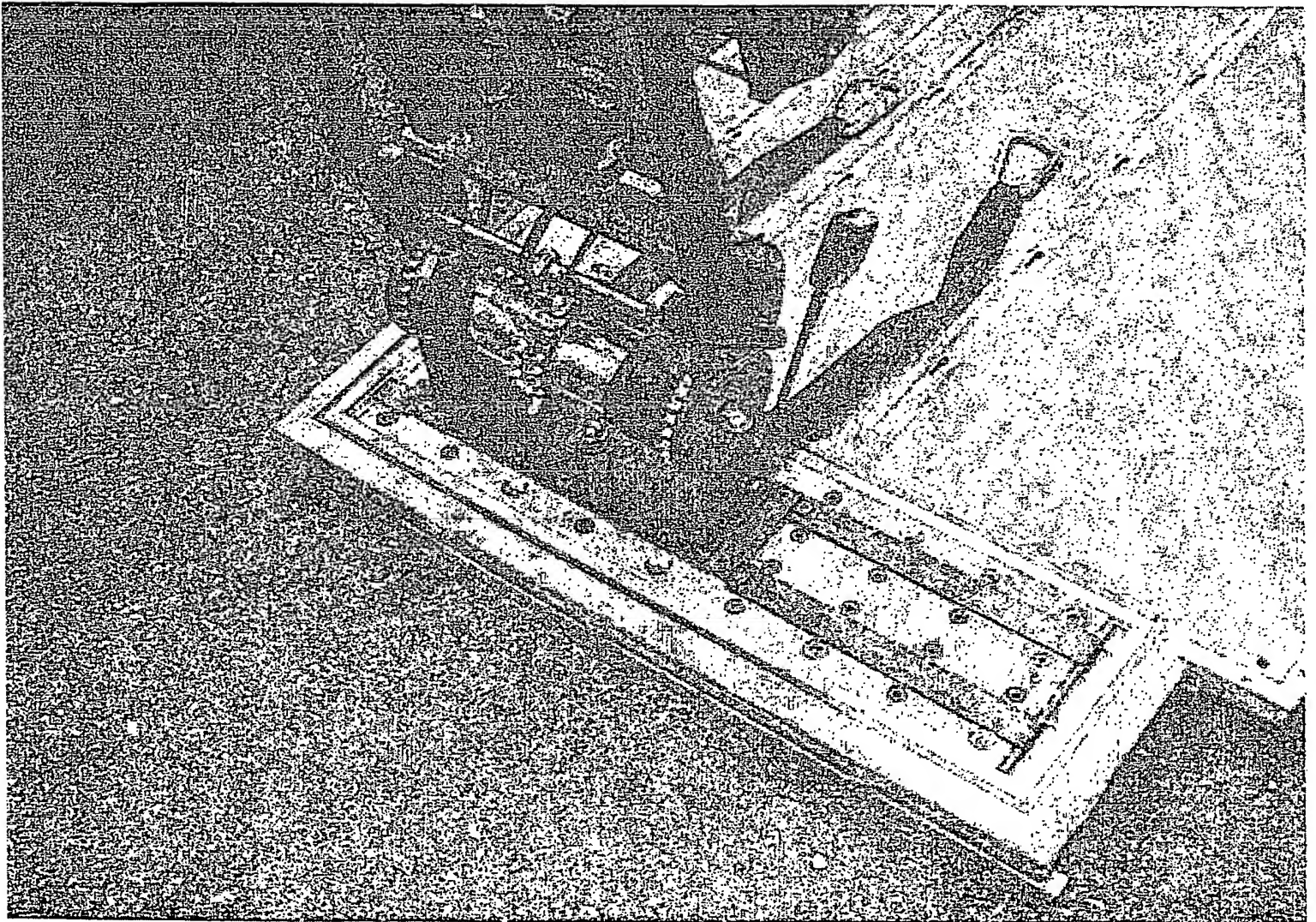


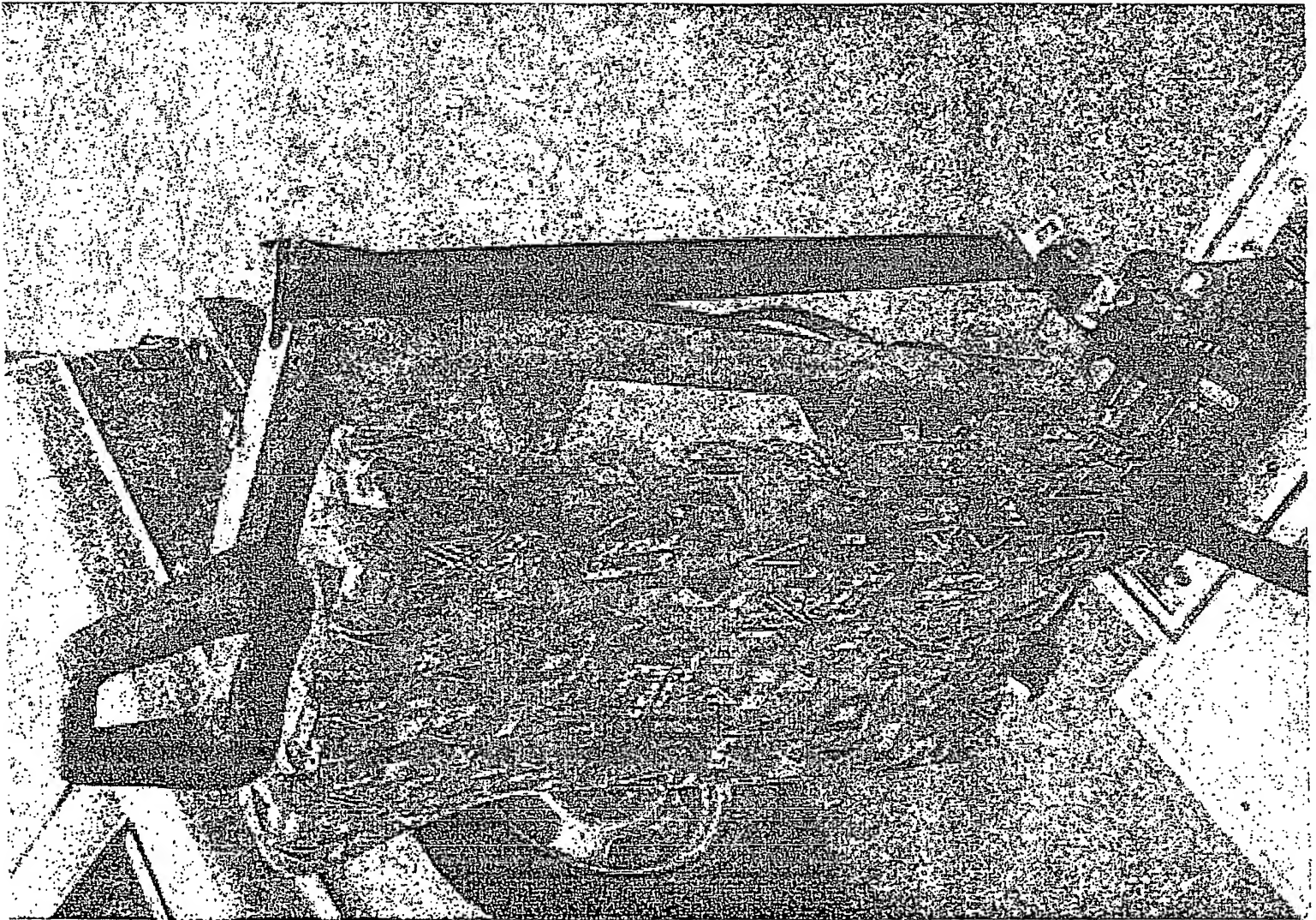




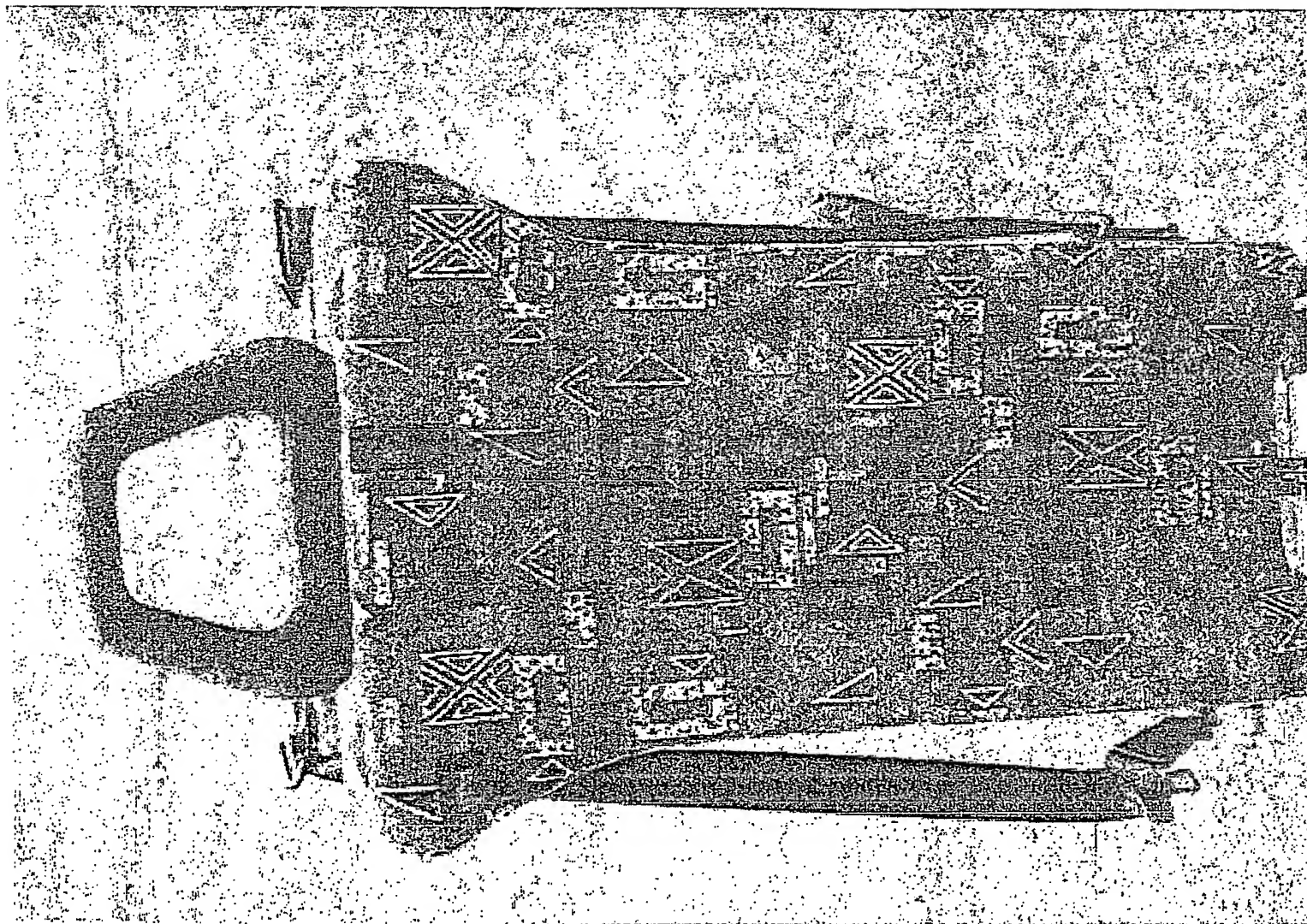












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